

Financial markets design and developing country growth.

The case of Dubai International Financial Exchange (DIFX)

Wael Saksouk DIT Sasso

S051581

Veileder: Dr. Armando José Garcia Pires

Master Thesis

Norges Handelshøyskole

Bergen, Spring 2007

This thesis was written as a part of the Master of Science in Economics and Business Administration program - Major in International Business. Neither the institution, nor the advisor is responsible for the theories and methods used, or the results and conclusions drawn, through the approval of this thesis.

Acknowledgments

I would like to show my appreciation to all those that saw me through this paper. First I would like to thank God for giving me the patience, and vision, to complete my work. I would also like to thank Dr. Pires for guiding me through out the writing process.

Thank you for my parents, brother Adham, and cousins Abir, Basil, Wassim, Hussein, and Brahim, for all the support they gave me. Finally I greatly appreciate the insights that my friends at NHH, United Arab Emirates, and the USA, provided.

Abstract

The aim of this thesis is showing how financial market design can facilitate the growth of developing countries. The paper is divided into two main parts (II and III). Part II explains how financial markets support developing countries by improving the accumulation of capital and increasing the pace of technological enhancements, since both advance growth and economic productivity. These two roles are in turn direct consequences of performing the six growth related functions: mobilization of savings; risk reduction; better information access; improved corporate control; facilitate the exchange; and support for financial integration. Part III, will then describe the design of the Dubai International Financial Exchange, as a financial market in a developing country, demonstrating how these six functions can be performed. Part I, only briefly, explains financial markets, and is there to provide a background for the reader. At the end of the paper, some recommendations and conclusions are discussed.

Table of contents:

Acknowledgements.....	II
Abstract.....	III
Table of contents.....	IV
Table of abbreviations.....	VI
List of tables.....	VII
Introduction.....	1
Part I: Financial markets, a background.....	4
1.0 Financial markets.....	4
<i>1.1 Definition of financial markets.....</i>	<i>4</i>
<i>1.2 Classification of financial markets.....</i>	<i>5</i>
<i>1.3 The stock market.....</i>	<i>6</i>
2.0 Emerging markets.....	8
2.1 Risk and return.....	8
2.2 Words of caution.....	10
Part II: Financial market development and country growth.....	12
3.0 Macroeconomic factors and liberalization.....	14
4.0 Financial market's functions.....	19
4.1 Mobilization of savings.....	19
4.2 Risk reduction.....	21
4.3 Better access to information.....	22
4.4 Corporate control and regulations.....	22
4.5 Facilitating the exchange.....	23
4.6 Financial Integration.....	23
5.0 Implications for developing countries.....	24
6.0 But which one came first? Critique of the direction of causation.....	30

Part III: Financial Market in a developing Country: Case of the Dubai International Financial Exchange (DIFX).....	32
7.0 The DIFX history, conception and reasons.....	32
7.1 DIFX infrastructure.....	34
8.0 DIFX rules and regulations.....	36
8.1 Listing rules.....	37
8.2 Business Rules.....	39
9.0 DIFX market model.....	40
9.1 Trading.....	41
9.1.1 Electronic platform.....	43
9.1.2 Market makers.....	45
9.2 Clearing process.....	49
9.2.1 Clearing and settlement.....	49
9.2.2 Collateral and margin requirement.....	51
9.3 Registry and Central Security Depository.....	54
9.3.1 The Central Security Depository (CSD).....	54
9.3.2 The shares registrar.....	55
10.0 Financial indexes.....	59
10.1 DIFC Arabia Titans 50 Inde.....	60
10.2 FTSE DIFX Index.....	62
10.3 ML Investable Index.....	64
Recommendations	68
Conclusions.....	71
Literature list.....	73
Appendices.....	80
Appendix I: List of product types and obligations.....	80
Appendix II: An example of a trade life cycle on the DIFX.....	86
Appendix III: Example of multilateral netting calculations.....	87
Appendix IV: List of companies compromising the DIFC Arabia Titans 50.....	88
Appendix V: FTSE DIFX index top five constituents and index series breakdown.....	89

Table of abbreviations

AED- United Arab Emirates Dirham
API- Application Program Interface
CCP- Central Counter Party
CMF- Clearing Member Firm
CSD- Central Security Depository
DCM- Debt Capital Markets
DFSA-Dubai Financial Securities Authority
DIFC- Dubai International Financial Centre
DIFX- Dubai International Financial Exchange
EAFE- Europe, Australia, and Far East
ECM- Equity Capital Markets
EM- Emerging Markets
FIX- Financial Information eXchange
FTSE- Financial Times Stock Exchange
G30- Group of Thirty
GCC- Gulf Corporation Council
GDP- Gross Domestic Product
GUI- Graphical User Interface
ICB- Industry Classification Benchmark
IPO- Initial Public Offering
ISIN- International Security Identification Number
ME-Middle East
ML- Merrill Lynch
MSCI- Morgan Stanley Capital International Inc
NASDAQ- National Association for Securities Dealers Automated Quotations system
NYSE- New York Stock Exchange
OECD- Organization for Economic Co-operations and Development
OTC- Over the Counter exchanges
SSP- Security Settlement Pool
SWIFT- Society for Worldwide Interbank Financial Telecommunication
T+3- Three days after trading day
Tbills- Treasury bills
TMF- Trading Member Firm
UAE- United Arab Emirates
USA- United States of America
VaR- Value-at-Risk

List of tables

Figure A: Risk return of emerging markets versus International and US.....	Pg 8
Figure B: Correlation coefficients versus the US.....	Pg 9
Figure C: Efficient frontier.....	Pg 9
Figure D: Financial liberalization trends.....	Pg 14
Figure E: Example of clearing with CCP and without CCP.....	Pg 50
Table 1: UAE equity markets figures.....	Pg 32
Table 2: Firms listed on the ML Investable Index and their weights.....	Pg 65

Introduction

The purpose of this thesis is first to describe how financial markets design can support the growth and development of an emerging economy. Following the approach of Levine (1997), I propose six functions that a financial market can perform with direct implications on growth. Afterwards the Dubai International Financial Exchange (DIFX) is studied. As a financial market in a developing country, in order to describe how its design supports the performance of these six growth related functions.

The link between the financial sector and growth has been highly debated. Some researchers argue that there is a low or even a non existent correlation. For example Chandavarkar (1992), while studying an assortment of unresolved finance and development issues, argued that the “literature leaves one overwhelming impression: Finance still remains very much the poor relation of mainstream development economics”. Stating that many of the founders of the discipline of development economics, including three Nobel Laureates, have not considered the financial sector an influencer of growth.

Others however disagree, for example Christopoulos and Tsionas (2003) stress the existence of a positive relation between financial and economic development. While studying empirical measures from ten developing countries and investigating the long run relationship between finance and growth, Christopoulos and Tsionas (2003) conclude that the results of their study are “in line with (those of) King and Levine (1993), Levin et al. (2000), Beck et al. (2000)...who find positive effects of financial depth on growth.” Also Calderon and Liu (2002), while probing a pool of 109 developing and developed countries, to investigate the “direction of causality between financial development and economic growth,” find that “financial development generally leads to economic growth” and that “financial deepening contributes more to the causal relationship in the developing countries than in the industrial countries”.

This dispute aroused my interest to research the topic, and build a better understanding of the nature of the relation. The reasons I choose the Dubai International Financial Exchange as the test subject, depicting how a financial market is indispensable for a developing country, is because it claims to be the first international exchange in the Middle East region. As well as its aim to bridge East with West increasing the global

presence of the Emirates, and is hoped to bring Dubai to par with the other world financial centers. As such it is a very good example of a financial market design supporting growth.

Moreover the image of the economies of the Gulf Corporation Council (GCC) countries (Saudi Arabia, Kuwait, Bahrain, Qatar, the United Arab Emirates (UAE), and the Sultanate of Oman), that most students have, is that they are purely oil revenue based. I believe this is an over simplification, and therefore want to increase the awareness to the fact that the governments of these countries have, since the American out lash to the oil embargo of 1973, been building and investing in other sources of income. This exchange is one step into achieving such a diversification. In which if successful, it will provide the UAE with a steady source of income, and will attract capital to the GCC region.

Problem definition

The DIFX is designed based on the experiences of European and Asian countries, most specifically the London and Hong Kong Stock Exchanges. True, Dubai is small in comparison, yet it aims big. The DIFX is built to become the financial center bridging the gap between investors in the West and those in the East, while at the same time improving the development and growth of the local economy. But how will this be accomplished?

The answer to the question “how has the exchange been designed as a financial market that will support the development of the economy of Dubai?” is explained by describing the influence of the six growth related functions: mobilization of savings; risk reduction; better information access; improved corporate control; facilitate the exchange; and support for financial integration. Which in turn allow for an improvement in the accumulation of capital and the pace of technological enhancements.

Methodology

The approach that was used in this paper, to provide a suitable analysis of the issue in question, is a qualitative research within the field of finance and economic growth. With concentration on those aspects that deal with developing countries. The aim is to analyze how a given financial market in a developing country, can in some way or another, act as a catalyst for economic growth. The first step was to describe those functions that the market performs which have a direct consequence on growth. Although researches

provide a multitude of different types of functions, for the purposes of this thesis I had to be concise. The result was the six growths related functions mentioned above, which can be considered an aggregation, and are supported by the study of Levine (1997) and Creane Susan et al. (2004).

The framework of the thesis starts with Part I introducing financial markets, and providing the reader with a background into their definition, different classifications, and describing stock exchanges. Then Part II consists of the theoretical explanations building the six financial market functions and explaining their influence on growth. Part III then provides a cross section of the DIFX design, shedding light on its components, while at the same time linking each design element to the growth functions. This is done by first describing the specific design element in question, for example the DIFX market model, as it is on the exchange. Then using relevant literature and studies, the benefits of this design element are discussed, showing how one or more of the six functions are being performed. The last sections of the paper are the recommendations and conclusions, which suggest possible guidelines to improve the future of the exchange, and provide some concluding remarks.

Part I: Financial markets, a background

The purpose of this part of the paper is to provide a theoretical explanation for financial markets, and for some of the central concepts used through out the paper. The intent is to provide a better understanding for the reader concerning these concepts and to introduce them, before they are discussed in the later parts.

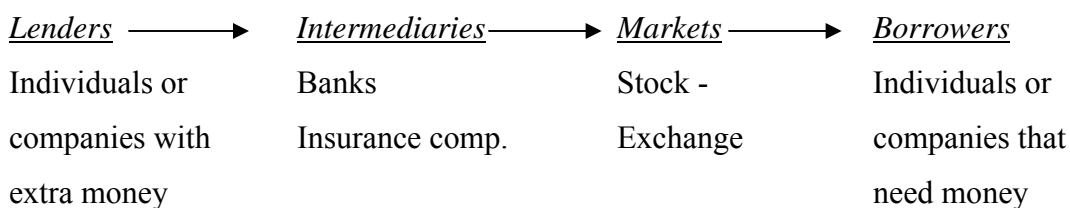
The subject of this thesis revolves around financial markets and developing countries, with the case of a stock exchange in the emerging market of the state of Dubai, in the United Arab Emirates. Thus the first section in this part will be an introductory overview on the concept of financial markets. Defining what constitutes them, describing some classifications that exist, and explaining what stock exchanges are.

The second section will then briefly touch on issues of finance and investment in emerging countries, as this will be engaged in more depth in Part II.

1.0 Financial markets

1.1 Definition of financial markets

According to Encarta encyclopedia, a market generally speaking is “a gathering in a public place for buying and selling merchandise”. As such one could think of a market as the place where those with a demand find supply. A man wanting an apple will go to a food market and buy one. The same applies for money, the *raison d’être* of a financial market is the “raising of capital and the matching of those who *want* capital (borrowers) with those who *have* it (lenders)” (Valdez, 2003). Usually there are intermediaries like banks or insurance companies that play the role of matching the borrowers with the lenders in the market, for a fee. An Example:



So the money will come from individuals that have an extra amount, by for example placing savings in the intermediaries (banks). Those intermediaries will go to the market and offer that money to who needs it, for a return often known as interest. As such for any market to function it needs suppliers, buyers, a turn over subject (for example an apple, or a financial security), a price for that subject, and a regulating authority to protect the interests of those involved. A financial market is a representation of the links between these elements. In which according to Bodie and Merton (2000), it “encompass(es) the markets, intermediaries, service firms, and other institutions used to carry out the financial decisions of households, business firms and governments”. Off course this however does not mean a market necessarily needs a physical structure or location to exist, on the contrary a market is a flow mechanism allowing these movements and interactions.

1.2 Classification of financial markets

There are hundreds of different securities traded, and there are markets for all those securities. Some are for debt, others for equity (stock, a stake in ownership), and yet others, for commodities. Below is a brief description of some of the different types of financial markets out there (Haney Scott, 1995):

Primary and Secondary markets: Markets for new issues of securities, for example a firm going for an initial public offering (IPO), are known as primary markets. On October 2005 the Lebanese communication company Investcom, went public on the market of Dubai, making it the first IPO on the Dubai International Financial Exchange. In primary market transactions, securities are usually purchased first by businesses, as a result of road shows, and then are made available to the general public. Primary markets are usually used by firms for three main reasons, to acquire capital, to achieve higher levels of liquidity, or for image and branding. As going public can improve the awareness about the firm and its reputation (Dorf and Byers, 2005). A study done in Poland in 2001, showed that 52% of Polish companies “declared that raising profile was a significant benefit from floating” (Driffill and Mickiewicz, 2003).

On the other hand, markets for trading existing securities are known as secondary markets. These benefit investors by allowing them to sell and buy securities as they find

fit, to make a profit and ensure liquidity. Some examples of financial markets trading in more specific securities include:

- *Loans and Security markets:* Loan markets usually involve transactions that are negotiated directly between the lender and the borrower, for example car loans or mortgages. Securities markets however, usually involve operations on some exchange and in an impersonal fashion. Trading is done on a trading “floor” in an exchange. Such as the New York Stock exchange, or in over the counter markets (OTCs), which involve networks of brokers trading through phones or computers, and these often involve the largest trade volumes.
- *Money markets:* These are markets for securities that mature within a year, treasury bills (Tbills) and certificate of deposits are two examples. Given that equity securities have no maturities, money markets deal only with debt instruments. Their main role is to help investors, whether government or individual, to cover short term obligations by providing liquidity. Money market instruments often have low default risk, as a matter of fact treasury bills are considered to be “risk free”. There are primary and secondary Money markets.
- *Capital markets:* These are markets for securities with maturities beyond one year. The two main products are stocks, traded on the equity capital markets (ECM), and bonds traded on the debt capital markets (DCM). The reason why these are known as capital markets is because the money generated from such market transactions, is usually used by firms to finance the purchase of capital machinery and assets needed for expansion. These also include primary and secondary markets.

1.3 The stock market

The history of stock exchanges can be traced to 12th century France, when the first brokers are believed to have developed trading in debt and government securities. Unofficial stock markets existed across Europe through out the 1600s, where brokers would meet in coffee houses to make trades. The Amsterdam Stock Exchange, created in 1602, became the first official stock exchange when it began trading shares of the Dutch East India Company. These were the first company shares ever issued (Valdez, 2003).

A Stock exchange can be defined as an organized market for buying and selling financial instruments, including stocks, bonds, options, futures, and derivatives. It is also the place where firms' stock prices are determined (Brigham and Houston, 2000).

There are two basic types of stock exchanges, the physical location exchange, like the New York Stock Exchange (NYSE); or the electronic dealer based exchanges, like the NASDAQ. These two types are extremes of a spectrum that covers the different designs of exchanges around the world.

The physical location stock exchanges

These are defined as “formal organizations having tangible and physical locations that conduct auction markets in designated, listed securities” (Brigham and Houston, 2000).

To be able to trade on these exchanges you need to be a member of the exchange owning a seat. These seats can be sold or bought, for example the NYSE currently has 1,366 seats, one of which was sold for \$1.7 million on April 25, 2000. The NYSE is actually a modified auction whereby people, through their agents, place bids and calls on stocks. It was created in 1817, with dealers meeting around noon time at 22 Wall Street. By the 1900s it became a dominating exchange due to the introduction of the telegraph and the ticker-tape (Valdez, 2003).

The Electronic and over the counter (OTC) exchanges

Although it is common to find the stocks of the largest firms traded on the physical stock exchanges, there is as I mentioned above, a larger number of stocks traded on the OTCs. In addition, electronic exchanges are becoming ever more popular due to the wide spread of the internet and the ease of trading. As a matter of fact in 2001 alone, the NASDAQ had almost twice as much companies listed as the NYSE (Valdez, 2003).

Over the counter exchanges were created to offer a possibility for smaller, newly developed firms, to raise capital. They usually consist of three elements, dealers that hold the inventory of the traded securities; brokers that act as agents linking dealers with investors; and finally the electronic systems needed to communicate and trade. Dealers set a price for which they are willing to sell (ask) or buy (bid) a certain security. These are usually set based on the demand and supply situations in the market. The difference between the two, known as the bid and ask spread, is the profit that the dealer will make (Brigham and Houston, 2000).

2.0 Emerging Markets

This section we will first look at the risks and returns of trading in new emerging markets, such as Dubai. Then some precautions that need to be considered, especially at the state level, are highlighted. These are based on lessons drawn from the Asian financial crises of the 1990s.

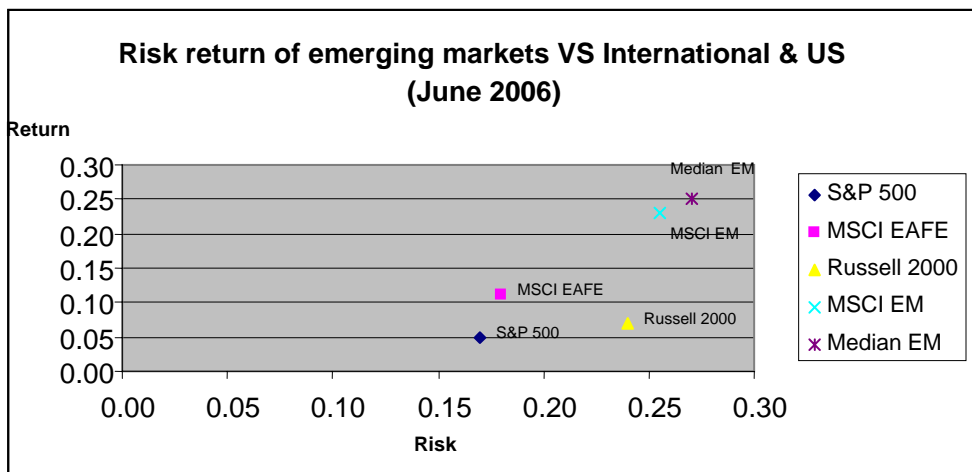
2.1 Risk and return

Anything that involves growth has to start small, whether it is a living breathing being, or a system resembling a living entity. Markets are no exception. The most developed today, where at some time or another emerging. Japan for instance, in the 1960s, was considered a developing market.

As of 1991 the total market capitalization of all emerging markets was around \$649 billion, this large figure should be no surprise. Investors are always looking for new opportunities, and emerging markets offer many benefits (Kolb, 1995).

Emerging markets are also going through phases of unprecedented growth, making them an attractive source of profits. Their instability and newness, however means they are quite risky. As can be seen in figure (A) below, the Median emerging markets index is at a high point of risk and return.

Figure A:



EAFE: Europe, Australia, and Far East

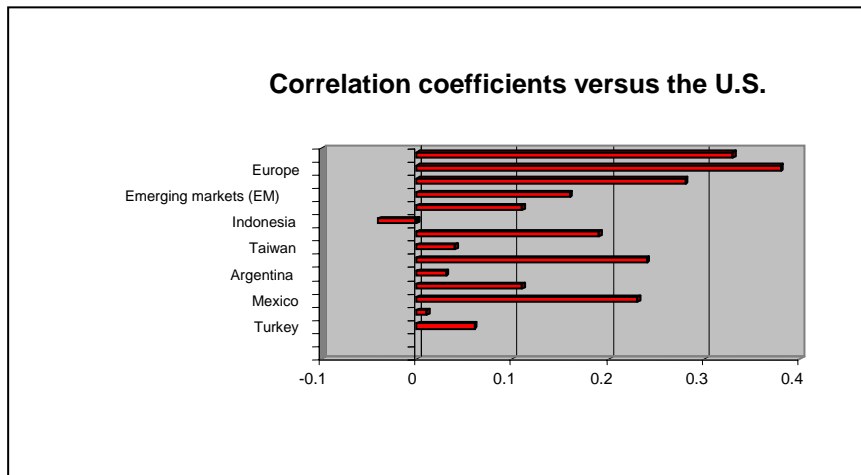
EM: Emerging Markets

MSCI: Morgan Stanley Capital International Inc

Source: Northern Trust, 2007.

Investing in emerging markets offers international investors an opportunity for high diversification. This is mainly due to the low levels of correlation between the returns of developing and developed countries. As you can see in figure (B), the highest correlation to the US markets comes from the also developed European markets, while the lowest comes from the developing markets of Indonesia, Turkey, or Taiwan.

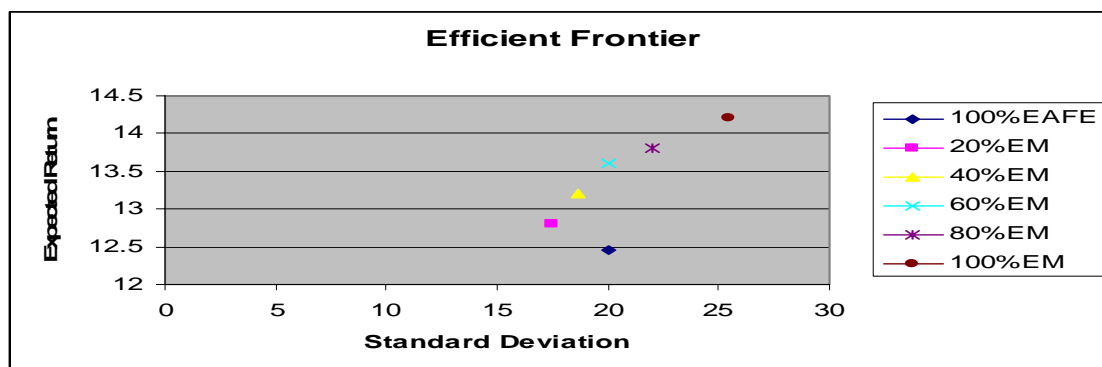
Figure B:



Source: Kolb, 1995, p. 63

As a matter of fact a portfolio's return can be increased dramatically without a change in risk, if one invests up to two thirds of that portfolio in emerging markets securities. In figure (C) below, moving from a 100% EAFE portfolio, to one with 60% investments in emerging markets (EM), standard deviation remains 20, while return increases by 9.6%, from 12.5 to approximately 13.7.

Figure C:



EM: Emerging Market

EAFE: Europe, Australia and Far East.

Source: Kolb, 1995, p. 65

2.2 Words of caution

Although there are many benefits and reasons for an optimistic view towards investing in developing countries; failures and crashes are natural, inevitable scenarios of any market. Let alone those risky developing ones. Therefore before going into Part II and discussing how financial markets designs can induce growth, a few cautionary points should be mentioned.

Recent and widely debated crises are those of the Asian Tigers, at the time money seekers flocked towards those economies as they flock to Dubai today. Again we have an emerging market with tremendous potential, growing a bubble that everyone hopes will never burst. Not learning from the experience of the Tigers is a mistake. Especially, as professionals argue, governments of those nations could have undertaken precautions to mitigate the effects of the crash. I will therefore suggest four common state level precautions that I concluded from the studies of the subject matter, done by Lane (1999) and Karunaratne (2002).

Float the Exchange rate: This is a fundamental principle; as a matter of fact countries suffering the financial crises of the 1970s, 80s, and 90s, all had fixed exchange rates.

But assuming that one rule should fit all, is an over simplification. A country should adapt to its own current circumstances, a pure float is not a necessity, dirty or a managed exchange rates can be applied. What needs to be understood is that the world markets today are open to each other, and no single central bank is powerful enough to face the forces these markets can apply.

The UAE since February 2002 has been using a “hard peg” with its currency at US\$1 = 3.67275 United Arab Emirates Dirhams. This is in line with a decision of the Gulf Cooperation Council (GCC) countries to peg their currencies to the US dollar, as a step towards establishing a common currency by 2010 (Kurt, 2004). It would therefore be wise for Dubai to have an exit strategy, in case speculators decide to profit and aim at the fixed exchange rate.

Limit borrowing in foreign currency: Another common feature among the crises countries was the large amounts of foreign currency debts they had. If mixed with a fixed exchange rate, this will most likely cause problems. In which if local UAE banks, attracted by the lower foreign currency interest rates, borrow for example Japanese Yen,

and then invest domestically in local currency. If and when the domestic exchange rate suffers, these banks will end up with large foreign currency debt and low real value domestic investments. A large enough deficit of this form will surely crumble an economy.

It is the duty of national agencies to monitor unhedged foreign currency loans, and place some restrictions on banks dealing with them. The latest published figures of the UAE central bank show Financial Accounts with a deficit as high as AED 21.2 billion, which approximately equals US\$5.7 billion (KSCC, 2005).

Open capital markets slowly: Countries like the USA have strong enough financial markets, and deep pockets, to cope with fully open capital markets. Newly developed economies that are still premature on the international arena should be more cautious. Here I am not encouraging protectionism, but stressing the fact that countries should make sure they have proper judiciary systems in place, and supervisory structures, before allowing their capital markets to be completely open.

Sound policies in place: Anything to function properly needs a strong base to keep it standing and ensure success. To maintain safe levels of current account balances policies should focus on creating sound fiscal and monetary practices. Proper supervisory and regulatory structures are a must. Furthermore laws governing transparency and standards (for example international accounting standards) should be adopted, as they attract investors and build trust in the economy.

In the Middle East, more than anywhere else, these practices are essential, with Dubai as no exception. This is due to the geopolitical nature of the region, the Middle East has unfortunately been a money laundering haven for many, and Dubai has been linked with questionable capital flows after the September 11, 2001 incident. Although the DIFC, DIFX's mother company, is committed to transparency and international financial standards, investors seem to be cautious. As one executive whose firm recently opened in the centre describes it "There is money here from questionable sources, which is very tempting. We haven't turned down money yet, but I expect it will happen" (The Economist, 2006).

Part II: Financial market development and country growth

The purpose of this part is to answer the question: How can the financial sector and markets in a developing country, help that country to grow and to become competitive on an international scale? This is an important issue for developing countries in general, as we enter the era of information technology, with new possibilities and opportunities spurring everyday. And specifically for the oil rich Gulf countries of the Middle East, that have huge cash reserves. With fuel prices reaching \$70 a barrel, some research estimates that by the end of 2007, 3.5% of the world's GDP, an amount of \$1500 billion will be transferred as wealth to the oil producing countries (Valdez, 2007).

The main principle here is that, “policies aimed at enhancing financial sector performance will result in lower information, transaction, and monitoring costs. A modern financial system promotes investment by identifying and funding good business opportunities, mobilizes savings, enables the trading, hedging, and diversification of risk, and facilitates the exchange of goods and services. These functions result in a more efficient allocation of resources, in a *more rapid accumulation of physical and human capital, and in faster technological progress, which in turn feed economic growth*” (Creane et al. 2004).

Thus I will show that financial markets support a developing country by: *improving the accumulation of capital and increasing the pace of technological enhancements*, since both improve growth and economic productivity. These two roles are in turn a direct consequence of performing the six growth related functions: mobilization of savings; risk reduction; better information access; improved corporate control; facilitate the exchange; and support for financial integration.

Now, are there any given measures, or a definition for a proper financial sector design? A specific definition is not really practical as it varies depending on the institutions and market structures we are considering, the economic environment we are dealing with, and the current technology level in the country. Most definitions however, mention that improvements in the financial sector are achieved if we have an increase in the efficiency and improved regulations, an increase in the number of financial services and products offered, an increase in private sector financing driven by market and profit considerations, and finally a rise in the proportion of the population having access to

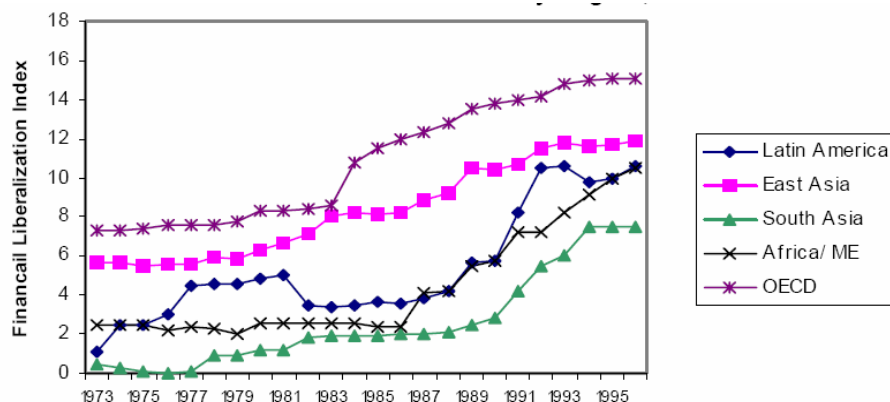
financial services (Financial sector development, 2004). These are issues that have relevance to the topic in this paper and will prop up through out the discussion.

This part of the thesis is divided into two sections, the first sheds some light on certain relevant Macroeconomic factors and their effects on the designs of financial markets, and the second explains how financial markets help in the growth and development of an economy.

3.0 Macroeconomic factors and liberalization

In order to achieve a competitive market; one where the ‘Invisible hand’ guided by price principles, supply and demand, stimulates growth; developing countries need to move from a managed economy to a free market economy. Two examples of success that developing countries can learn from are, Hong Kong where liberalization and reforms of the financial markets was a main reason behind its famed achievements (Chen, and Raymond, 2000), and Poland where privatization, continued government efforts to improve the financial markets, and strong regulations proved indispensable for the transition process. That was “instrumental in supporting exceptional results in economic growth” (Driffill, and Mickiewicz, 2003). As a matter of fact figure (D) below, shows that since the early seventies financial liberalization has been a growing trend in most regions of the world. There are two points I would like to stress from this figure, first of all it is clear that the Middle Eastern countries still have a long way to go, if they ever want to be comparable with the developed world. Secondly financial liberalization never stopped, or even slowed down in the OECD countries, actually around 1982 we have a sharp increase where they continue from there. This means that if the emerging countries of the world want to achieve self sufficiency and economic independence, they really need to give more importance to improving the design and functioning of their financial markets.

Figure D: Financial liberalization trends



OECD: Organization for Economic Co-operation and Development

ME: Middle East

Source: Rojas and Liliana, 2004

According to The New Dictionary of Cultural Literacy, a market economy is one where “the greater part of production, distribution, and exchange is controlled by individuals and privately owned corporations rather than by the government and in which government interference in the market is minimal”(The New Dictionary of Cultural Literacy, 2002). Improvements in financial markets and their efficiency are essential for the transformation to occur from a managed to a market economy. One that a developing country should aspire to, as mentioned above. The financial markets are needed because with central planning governments decide the allocation of resources. Eliminating the planner will thus result in a decision making gap. Free markets where lending is rationed by prices will fill this gap, deciding what is the most optimal need for resources. However developing countries should be cautious when implementing this change, for example the 1997 financial turmoil in East Asia is thought to have started by excessive liberalization, before the banking regulations and proper supervisions were in place. The large capital inflows at the time led banks to over leverage certain industries, especially real estate, to the point where risk exposure to non performing assets was dramatically increased, leaving the markets susceptible to illiquidity (Chen, and Raymond, 2000). Thus it is not advisable to simply import the structures of already developed economies, expecting them to work.

Universal banks and capital markets are the two major institutions providing support to the transformation.

Universal banks are distinguished from ordinary banks in that they are permitted to offer both commercial and investment banking services, like the underwriting of securities or trading in the secondary market. Most importantly however these types of banks can own equity in firms they leverage. As such universal banks can monitor and pressure managers to perform better through their equity control and by withholding credit. Moreover by offering more services simultaneously economies of scale are achieved, which will mean lower costs and higher efficiency for the entire economy.

Capital markets, as defined in the financial markets background section above, are markets for securities with maturities beyond one year. With the two main products being stocks, traded on the equity capital markets and bonds, traded on the debt capital markets. With a 31% return for developing countries equity markets in 2005, and Middle Eastern

banks planning to invest billions of dollars in debts (Valdez, 2007), the influence these markets will have should not be underestimated. Their role mainly involves aiding the privatization process, improving corporate control, allowing savers to diversify their portfolios, and attracting foreign funds.

Starting with the equity capital markets, I will first for the sake of clarity, repeat the definition of a stock exchange: It is a market providing “the regulation of company listings, a price formation mechanism, the supervision of trading, authorization of members, settlement of transactions and publication of trade data and prices” (Valdez, 2007).

To develop such equities markets, that offer possibilities for households to buy shares and invest in firm ownership, a robust regulatory body uninfluenced by political considerations is first needed, combined with a liquid and competitive banking system able to offer proper settlement and clearing of transactions. To ensure that market participants trust in the efficiency of operations, and that prices are truly set by market forces, it is essential to have clear avenues for the spread of information, and the use of accepted accounting and auditing standards. The level of support drawn from such a market will depend on its operational efficiency. Diversification possibilities it offers investors, making it an attractive portfolio element, and its solvency level, which influences the ability to use the market as a source of new capital, will also matter. For example by 2001 and with 230 listed securities, 61% of polish companies stated that the availability of capital was the main benefit from floating (Driffill, and Mickiewicz, 2003).

Bond capital markets in developed countries are often used by enterprises to raise capital. The cheapness of these securities makes them attractive. In developing countries these markets however, are often only accessible by the big players, who's well known brand names offer collateral guaranteeing they can pay back the debt. Therefore the smaller firms that would benefit most and use bonds to survive might not always have access to the bond market. To solve this problem and offer admittance to a larger number of firms, authorities of emerging markets depend on internationally recognized rating agencies. These usually have better access to the financial information of the smaller firms, as such

investors, depending on the ratings of these agencies, might trust more in bonds of the less recognized firms, and offer them financing.

From the prior discussion there are two main implications that can be drawn for developing countries. The first is that, to improve they need to move from a managed to a free market economy. The importance of financial markets here is that they facilitate this transformation, by replacing the central planner. However as the East Asian financial busts clearly show, this should be done cautiously. Research so far provides the following explanations for why problems might arise (Caprio et al. 1993):

- First of all suddenly imposing hard financial constraints and budgets on firms that had operated in central economies will cause numerous bankruptcies. This is because solvency of debt recipients in planned economies is usually less an issue than having the activity they will undertake serving the grand plan.
- Secondly developing countries usually have less qualified human and technological resources than their developed counterparts.
- Thirdly if a developing country decides to copy the financial market designs of developed countries, there are many different forms to choose from, each tailored to the economy it serves. As such developing countries should be careful to assess which features they need most and compromise the others.
- Finally a proper regulation and supervisory body is essential.

The second implication is that, given Universal banks and capital markets are the two major structures influencing the transformation, developing countries are advised to try and include these two in the design of their financial markets. The basic elements that developing countries should have in place to create a proper ground to make the most of these structures are, a strong judiciary body that can impose proper supervision and regulations; a banking system liquid enough to insure quick and safe settlements; the adoption of international auditing standards; and using the services of rating agencies that build trust in local firms, improving their access to available capital. This, for example, is done by giving recognizable ratings to local bonds. A triple A (AAA) bond is of the same quality whether the issuer is a large conglomerate, or a local developing country entity.

The result will be an increase in the number of small firms with correct success fundamentals receiving loans. This will cause an overall increase in the number of successful firms in an economy, raising production on the one hand, and diminishing the monopoly power of the large firms on the other.

A parable

For any financial market to operate it needs intermediaries, like banks or funds to serve as the link between the supply and demand for money. Levin (1997) lists five functions of the markets and their intermediaries: Mobilization of savings; risk reduction; better access to information; facilitating the exchange; and corporate control. I would like to add to these one more, which is support in attaining regional financial integration.

Before I explain in the section below, titled financial market's functions, how the financial markets and intermediaries serve the economy, through achieving these six functions, it is important to note that the effects can be summed into two general themes. The first is the influence on capital accumulation, and the second is the improvements in technology. To see this, let us assume we have the following situation: Khalid, a Kuwaiti chemical engineer that graduated from Germany, has been working for some years in an industry in his developing country. Ever since he started working, Khalid was always looking for a new idea or innovation that would put him in the spot light, and also benefit Kuwait. Through the years he finally gets his break through, and creates chemical X, with fundamental industrial benefits. The next step would be to get chemical X to the market. For this he needs funding, a proof of the economic viability of his product, and will likely also need to introduce some adjustments making it acceptable. A medium that can simultaneously present these services is a well designed financial market. Khalid can use it to try and get financing, which will automatically place his idea under the scrutiny of the market and investors. Offering capital only if the idea is viable. This is the capital accumulation benefit, in which the financial markets accumulate capital that is later directed towards promising investments. Even if Khalid has the money to start production, he will likely not want to risk it all alone (no diversification), in addition the market can offer a more permanent source of capital in case of future contingencies. Therefore "liquidity, risk pooling, and diversification," features that developing countries

should try and have in their financial markets, would help Khalid (and people like him) start projects (Levine, 1997).

To offer financing investors must trust in the product, here again a well designed financial market is important, since “financial systems must be able to acquire information” and “must monitor managers and exert corporate control” (Levine, 1997).

Now if Khalid does get funded, this extra cash and market interaction will provide the resources and knowledge to improve chemical X, tailoring it to fit economic demand. This is the technological benefit, because collectively market participants have the ability to study business fundamentals better than any single planner, increasing the likelihood funding goes to the most innovative projects. The interaction with the market will also offer Khalid better knowledge about how to design his product features to better serve the demand in the economy. Moreover the transaction feature¹ of financial markets, means that Khalid can specialize in producing chemical X, resulting in more efficient output.

Expanding on this scenario and assuming that we have a thousand Khalids in an economy, each having a new innovation; it becomes easy to see how financial markets help in development.

4.0 Financial market’s functions

This section explains the benefits that a financial market offers an economy. This is through better accumulation of capital and improved technological progress, by performing the six functions: mobilization of savings; risk reduction; better information access; improved corporate control; facilitate the exchange; and support for financial integration. The next section will then concentrate on what conclusions and implications can be drawn for developing countries.

4.1 Mobilization of savings

Without the possibility for households to have a secure place to save their accumulated income, they would be forced to have it in the form of wealth (for example land, jewelry, or houses) rather than cash. This will result in most of the income in an economy

¹ Buying and selling. As such one can buy what he/she needs, and sell what he/she produces. This will allow for higher specialization in production.

converted into illiquid securities with low risks, and low return. One of the roles of a financial market is to act as the entity allowing for the secure deposits of savings. In normal conditions the majority of a population is expected to have short term liquidity needs, less than the full amount of deposits. Thus a portion of these savings can be offered for investments. Using the 'AK' model, the link between output and the savings mobilization provided by the financial market can be better understood.

The model states that output (or production Y) depends on capital K and technology A, in such a way that:

$$Y = AK \quad 1$$

And if we consider that savings (S) are channeled into investments (I), with a portion $1-\emptyset$ lost as frictions (transaction costs), from operating in the financial markets, then:

$$\emptyset S = I \quad 2$$

Gross investments, with \emptyset for depreciation, will equal:

$$I = K - (1-\emptyset)K \quad 3$$

Using equation 1 the rate of growth (G) over time $t+1$ will be:

$$G_{t+1} = Y_{t+1}/Y_t - 1 = K_{t+1}/K_t - 1 \quad 4$$

And the steady growth rate can be written as:

$$G = A(I/Y) - \emptyset = A\emptyset s - \emptyset \quad (\text{where } s = S/Y) \quad 5$$

From equation 5 it can be seen how a financial market helps growth. In which any improvements that reduce transaction costs, will cause a drop in the percentage of the savings lost to frictions ($1-\emptyset$), meaning that more will flow into investments that support growth. To make this clearer, I have mentioned that $1-\emptyset$ represents the amount lost due to frictions, thus \emptyset is the percentage of the savings invested. Advancements in financial

markets, or in financial markets' design, can cause cost reductions. For example, improvements that result in an increase in the number of financial intermediaries reduce the possibility of a monopoly and bring prices (transaction costs) closer to those in an efficient market. This drop in the prices represented by a smaller $1-\theta$, charged by the intermediaries, will mean that a larger portion, θ , of the savings will go to investments. This will increase the ratio I/Y (or θ) in equation 5, and thus increasing growth (G) (Pagano, 1993). Moreover financial markets designs by giving incentives for households to invest, for example offering profit opportunities, encourage savings. Thus causing an over all increase in the amount of money saved in an economy, which in turn will mean more capital is available for investments and growth.

4.2 Risk reduction

There are two ways through which a financial market helps development by reducing the element of risk in investments. The first is the reduction of liquidity risks. Due to the pooling of resources of many households, and the fact that one often expects to have more deposits than withdrawals at any given time, the markets allow for having long term capital. The effect of this can be better understood if we consider the situation in the absence of financial markets, in which case each household would only offer short term loans worried that some personal liquidity need might crop up. As such a liquidity risk “arises due to the uncertainties associated with converting assets into a medium of exchange” (Levine, 1997). The sources of such uncertainties, information asymmetries and transaction costs, push for the creation of financial markets to amend them, and offer capital accumulation.

Secondly default risk is reduced due to higher levels of diversification offered by the financial markets; this again is due to the pooling of resources. An investor would be more inclined to finance a risky project with long term returns, for example digging for oil, if his or her portfolio also contains less risky investments, or investments in several different industries. Furthermore, risk diversification will allow for technological improvements. Investing in high-tech entrepreneurial ventures is risky business as such it is very unlikely that a single investor (saver) is willing to provide all the financing alone.

Markets offer the venture the possibility to attract resources from a larger number of savers.

4.3 Better access to information

Although the easy access to information and technology has made communication cheap, individuals have little capability, and will face too many costs, to sort all the data they are bombarded with. Information is often used to decide which projects offer the highest yield and are most productive, to help in price discovery, or to forecast market trends and sentiments. These “information acquisition costs create incentives for financial intermediaries to emerge” (Levine, 1997). By sharing the costs among the many investors, intermediaries and markets are able to aggregate information and offer it in an easy, efficient, and cost effective manner. Rather than each investor having to individually incur the fixed costs.

Through experience markets also become more specialized in collecting and interpreting information, increasing the likelihood that resources will flow to those entrepreneurs with a higher probability of success (Levine, 1997). Thus better access to filtered information will allow for better decisions, avoiding those low yield investments. More resources will then flow into competitive projects, improving the rate of technological progress (Financial sector development, 2004), and adding to growth.

4.4 Corporate control and regulations

As explained above financial markets improve the availability of information about managers’ operations and firms *ex ante*, thus helping in making better investment decisions. They also improve corporate control after an investment. In which rules, regulations, and monitoring standards, employed by authorities managing the financial markets and intermediaries, far exceed the ability of household savers. These better control measures ensure fair return for investment and reduce fraudulent activities, for example stock exchanges often demand high level of transparency and quarterly improvements. Financial systems that offer proper corporate control also reduce the agency problem, allowing for the beneficial separation between management and

ownership. Which in turn “makes feasible efficient specialization in production according to the principle of comparative advantage” (Levine, 1997).

The resulting enhanced allocation of capital will support better development and increase the household income (Financial sector development, 2004).

4.5 Facilitating the exchange

In the section prior, titled Definition of financial markets, I explain that the main purpose of these markets is to act as the space where those who have a demand are matched with the supply. This function is essential in helping countries develop due to the fact that it increases specialization.

If we consider the case of barter markets, which in retrospect are the origin of today’s financial markets, the more developed one is, the larger the number of items exchanged on it, and the more trades occur. Resulting in households being confident they can find what ever they need and exchange for it. Each household will then specialize in what it does best, producing it efficiently (lowest opportunity cost), and trade for it. The same applies to the case of a financial market; the only difference in this instance is that money is now used as a medium facilitating the trade, but for the purposes of specialization a more developed market will still have a positive affect. The idea of specialization helping growth goes back to Adam Smith’s Wealth of Nations, where he argues that the “division of labor-specialization is the principle factor underling productivity improvement” (Levine, 1997). As a labor unit concentrates on producing what it does best and trades it with others, it will move higher on the learning curve. The net effect will be higher efficiency production in all households leading to improvements in the productivity of the entire economy, and more innovations.

As such any elements of the design of a financial market that can increase the rate of transactions, or the number of traded securities, will improve specialization that supports growth.

4.6 Financial integration

In order to achieve the highest levels of efficiency, countries undertaking financial liberalization of their markets should aim to improve regional integration. Since

“liberalizing capital markets (of developing countries) and their regional integration are necessarily intertwined processes” (Knapp and Velasco, 1997). Especially that trading in financial markets is of a network nature, implying that size does matter. For such integration to happen however there is a need to first align the rules and regulations and adapt them to benefit the international investor. The Gulf Cooperation Council (GCC) countries are in the early stages of achieving such a financial unity. The first steps involved putting into action a plan to have a fully convertible common currency by 2010, and the creation of the GCC Charter which aims to “effect coordination, integration and interconnection among the Member States in all fields in order to achieve unity” (Al-Khazalia et al. 2006). The common currency and nonrestrictive foreign capital transactions will attract investors, widen the pool of resources available, and improve market efficiency. As traders will have the ability to better choose among available securities, whether local or regional.

Studies focusing on the link between the Gulf Cooperation Council markets and global markets mostly show that there is either a negative correlation or no link at all (Al-Khazalia et al. 2006). Thus on the one hand GCC markets can offer good international diversification, but on the other there is the question of whether or not inter-regional investments also offer diversification. Research undertaken by the American University of Sharjah studies the level of integration between the markets of four Gulf countries, Kingdom of Saudi Arabia, Kuwait, Bahrain, and Oman. The United Arab Emirates and Qatar were excluded due to the newness of their markets and the lack of data; however the results still apply to these two markets (Al-Khazalia et al. 2006). The results show that although there is very little possibility for any inter-regional diversification, integration is a necessity to tie to the global markets. Taken alone no single Gulf market is large enough in terms of capitalization, trading volume, or listed companies, to allow for any efficient diversification on a global standard.

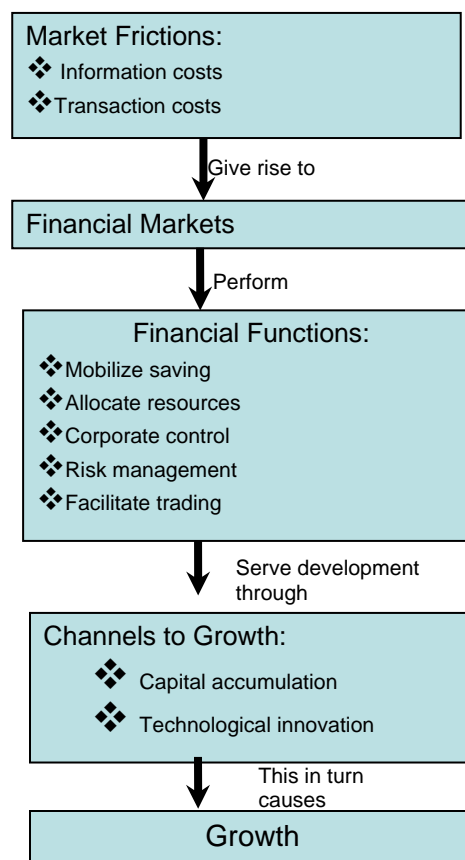
5.0 Implications for developing countries

Financial systems are needed by developing countries because they improve the pooling and diversification of risks, provide better information access, facilitate the exchange of resources, offer households the ability to save and channel these savings to their best

uses, monitor firms and their managers much more efficiently than any individual can, and finally facilitate financial integration.

The importance of these functions for a developing country's growth arises from their influence on capital accumulation, which occurs through the improvements in the saving processes. And secondly on technological advancements, that are driven by an increase in specialization and innovations.

The inference for a developing country, that to achieve growth it needs a properly designed financial system, is also concluded in Levine's (1997) article, where we have:



In the section previous, titled financial market's functions, I describe how a financial market functions to support the development and growth of a country; below more emphasis will be put on the implication of each function for a developing country.

Mobilization of savings implication: For a financial market to be successful in attracting savers thus becoming a receipt for their deposits, a developing country has to design the financial market to first of all overcome the transaction costs incurred in collecting the

savings. And secondly to reduce the gap resulting from information asymmetries to the point that savers are “comfortable in relinquishing control of their savings” (Levine, 1997). With regard to mitigating the transaction costs due to mobilizing savings from many different agents, financial intermediaries like funds can play an important role. Furthermore, developing countries should encourage the creation of contracts between the producers (in need of capital) and savers (with surplus capital); steps taken to promote and ease listings of stock exchanges are an example. To prove the soundness of, and encourage trust in, the financial market, governments of developing countries can start by investing in the markets themselves. They should also assign authorities that demand high transparency using accepted standards, or use the services of internationally accredited rating agencies (Levine, 1997).

Risks reduction implication: The first risk is the liquidity risk, and it affects growth by reducing, if not eliminating the possibility for investments in production or capital equipment that are needed for the development of an economy, as these usually have long term financing needs, and “savers do not like to relinquish control of their savings for long periods” (Levine, 1997). The implication for developing countries is to create financial markets designed to supplement the liquidity of long term investments, encouraging illiquid (long term) high return projects that are the corner stone of growth. Going back to history, Sir John Hicks, as cited in Levine (1997), postulated that the improvements in the capital markets, reducing liquidity risk, offered major support to England’s industrial revolution. A more recent case is the building of the Dubai subway that is currently underway.

The second, as explained in the sub-section Risk reduction above, is the default risk. Which if substantial, it would push investors away from high return, high risk investments.

These two risks give clear motives for a developing country to create well functioning stock exchanges. In which a liquid exchange, by accumulating capital, offers financing possibilities to firms and allows households to sell securities they own, thus by “facilitating trade stock markets reduce liquidity risk” (Levine, 1997). Furthermore an efficient stock exchange with relatively lower costs, will offer more transactions in the secondary market, this supports growth by allowing investments in long gestation period

projects. This is because while many savers might be reluctant to freeze their capital for long periods, the secondary market offers short term investment possibilities in these projects.

In short, developing countries should not only have stock exchanges, but ensure they are efficient enough with high levels of transactions, offering good liquidity.

Information access implication: For developing countries, whose financial markets are often held back by the unavailability of information, access to higher quality information affects growth through the influence it has on managers' performance. The fact that markets and their intermediaries can provide information (not just data), results in a more knowledgeable choice concerning which investments are productive with good returns. This in turn forces managers to improve their operations or risk not having investors. Collectively a larger number of managers in a developing country are thus forced to improve their operations, improving over all output. The size of the stock market also offers incentives for individuals to collect information about firms, in which the larger it is, the more investors can gain from hording the knowledge, and this improved "information about firms should improve resource allocation substantially with corresponding implications for economic growth" (Levine, 1997).

Therefore developing countries should advance information allocation in the markets. This can be done by licensing authorities responsible for firm monitoring; imposing disclosure rules like the Regulation Fair Disclosure rule put by the Securities Exchange Commission, in the U.S; requiring firms to publish detailed information including price-earnings ratios, equity and debt market activities, dividends announcements, new investments, and changes in leadership; and authorities could also reward voluntary disclosure of information by creating awards for firms consistently offering high quality information (Gibbins et al. 1990).

Better information availability, simultaneously improves productivity of existing firms, and increases the likelihood of capital flowing to the most promising new ventures. In the 'AK' model previous, equation 1 'A' represents technology, i.e. the productivity of capital, by increasing the value of 'A' through better access to information, an economy will be able to increase its output even if it does not increase the amount of capital 'K'.

Improved corporate control and regulation implication: I discuss in the section titled Macroeconomic factors, the need for developing countries to liberalize their financial markets. By eliminating the central planner markets and their participants will have much higher levels of freedom. This however implies that comprehensive regulations should first be in place in those developing countries aspiring to transform, in order to protect the participants and maintain stability. Analysis of the reasons behind some of the major financial downturns like the “debt crisis of the 1980s, the Mexican crisis of 1994-1995, the East Asian crisis beginning in 1997 and the Russian crisis of 1998”, show that robust regulations can actually reduce the impact of crisis during periods of acute reversals of capital inflows (Alici, and Ozgoker, 2006). However, and like most projects undertaken by developing countries, the reforms designed are usually based on importing schemes already in place in the developed world, with the Basel committee model often setting out the general outline used. To ensure a better fit between these imported regulation designs and the market situation of the developing countries, governments should start by enforcing uniform accounting and reporting systems. Later on, they can impose external and independent auditing of the financial markets and intermediaries, encourage the creation of strong judiciary systems, set enforceable responsibilities for company board members, and attract skilled personnel to undertake supervision without political influences. These are fundamentals that many developing countries still lack, especially during the early vulnerable years (Alici, and Ozgoker, 2006).

Facilitating the exchange implication: Through the function of improving the exchange, specialization is the main growth relevant result that the design of a financial market can offer.

More specialization will however mean more transactions, and here lies the implication for developing countries. To help in facilitating these transactions, developing countries should design financial markets with the aim of reducing transaction costs. More efficient financial markets, that better facilitate the exchange, will also improve productivity (Levine, 1997). One way to reduce transaction costs due to specialization is to make it easier for international and domestic investors to exchange with each other, by for example using a fully convertible domestic currency. Another is to offer better means to search for and find information on the availability of securities and their prices.

Governments of developing countries can also improve specialization by opening the local markets to imports, increasing the availability of products locally, while at the same time promote exports of products manufactured domestically.

Financial integration implication: Given that developing countries should liberalize their markets as a step towards achieving better financial markets design, the challenge is to try and make the most out of the liberalization. A key “requirement is to create institutions that strengthen the positive aspects of financial integration” (International Monetary Fund website, 2001). The reforms should take place in an institutional environment that can support them and avoid crises. Two approaches are used to achieve financial integration (International Monetary Fund website, 2001):

- The conventional view: It highlights the importance of macroeconomic stability, and financial reforms as precursors to integration. As such liberalization should occur gradually, and developing countries should first start with a process of financial reform.
- The political economy view: Stresses political influences, especially external influences affecting the ability and structure of financial reforms that a country is undertaking. In this view financial integration and opening of markets, is treated as a “big bang” that enforces the reforms.

The experience of countries adopting either approach shows that both have their merits, but what matters most is the “consistency of the reforms and policies that follow” (International Monetary Fund website, 2001).

The implication for a developing country is that it should choose an approach, depending on how much involvement in the international financial markets it already has, and then commit to it. By opening the markets to each other, the creation of international exchanges is in line with achieving integration. Today the DIFX is the newest addition to the region. For it to succeed against its competitors including, the Tadawul exchange² in Saudi Arabia, launched in 2001, it should push for regional compatible regulations that allow for easy access within the regional markets. Investors can then treat them as a single large entity. In the future, the exchange can embark on bilateral agreements

² The size of the Tadawul exchange is the main advantage it has. If it decides to concentrate on international transactions, it can prove a tough competitor for the DIFX. Especially that it is older, more credible, and highly liquid.

similar to the one struck between Bahrain and Kuwait in 1997, to introduce a unified settlement system, and allow the cross listing of local stocks.

6.0 But which one came first? Critique of the direction of causation

It is evident that there is a relation between financial markets and country development, but the direction of the causation is somewhat debated. Which one comes first, improvements in the financial sector causing growth, or country development and growth attracting investments and pushing for the expansion of the financial sector? A comprehensive presentation of the research for either side is not the purpose of this paper; as such I will only mention two prominent studies with relevance to the topic at hand.

The first is that of King and Levine in 1993 studying a group of 80 countries from 1960 till 1989, aimed at analyzing the capital accumulation patterns in these countries and its affect on productivity growth. They studied the direction of the causation by measuring the financial depths (liquid liabilities/GDP) of these countries in the 1960s, checking if there is a correlation between the amount of resources held and growth. The results showed a large positive relation. As a matter of fact they concluded that if Bolivia (one of the countries in the study) had in the 1960s improved its financial depth from 10% of GDP to the average value for developing countries, 23%, its GDP by the 1990s would have been 13% larger.

The second study is a more recent research by Calderon and Liu (2002), where they divide the propositions, improvements in the financial sector causing growth, or country development and growth attracting investments and pushing for the expansion of the financial sector, into two hypothesis, adopted from Patrick (1966): a “supply-leading and a demand following”. The supply-leading hypothesis “posits a causal relationship from financial development to economic growth, which means deliberate creation of financial institutions and markets, increases the supply of financial services and thus leads to real economic growth.” The demand-following hypothesis “postulates a causal relationship from economic growth to financial development. Here, an increasing demand for financial services might induce an expansion in the financial sector as the real economy grows” (Calderon and Liu, 2002).

There were five main results from this study, the ones with direct repercussions for developing countries where first, that financial market improvements lead to economic growth in all the 109 countries they studied, of which 87 were developing (Calderon and Liu, 2002). Secondly, although there are signs of bidirectional causality between financial improvements and growth, the evidence shows that for developing countries financial depth contributes more. Thirdly, the effects of an improved financial sector became more apparent as time passed. And finally the influence of finance on growth seems to be larger in developing countries, than industrialized ones where the opposite is true.

The study provides three important implications for developing countries that are to be considered in the design of a financial market. First, developing countries should improve their financial markets depth, measured by the level of intermediaries' market participation, as that would prosper the economy. Second, since improvements in the design of financial markets have more weight in the causal relationship in developing countries, improvements in the quality of the financial intermediaries is essential. Third, developing countries aiming at achieving sustainable economic growth, through, for example, industrialization or diversifying into permanent sources of income; should start by building a strong financial market by embarking on financial reforms. Furthermore to make the most out of the positive relation between financial and economic growth, liberalizing the economy and the financial systems is advisable.

Part III: Financial market in a developing country: The case of the Dubai International Financial Exchange (DIFX)

The purpose of this part of the paper is to explain the Dubai International Financial Exchange by presenting a descriptive analysis³, elucidating to how its design improves the accumulation of capital and the pace of technological enhancements, in the United Arab Emirates economy. The emphasis will be on performing the functions: Mobilization of savings; Risk reduction; Better access to information; Improved corporate control; Facilitating the exchange; and Financial integration.

7.0 The DIFX, history, conception, and reasons

The UAE accounts for approximately 15% of the total volume traded in the Gulf Corporation Council (GCC) markets, a total of US\$407 billion. And as can be seen in Table 1 below, equity markets in the UAE have been on the rise since 2000 with total market capitalization at the end of 2004 placing the UAE as the third largest market in region, after Saudi Arabia and Kuwait (KSCC, 2004).

Table 1: UAE equity markets figures

Index	2000	2001	2002	2003	% change	2004
General	982.7	1205.2	1,376.0	1,809.1	31.5	2,437.9
Banking	983.3	1313.8	1,615.0	2,179.7	35.0	2,799.3
Service	993.6	1062.9	1,033.9	1,322.6	27.9	1,861.2
Insurance	914.3	998.4	1,237.3	1,537.2	24.2	2,269.1

Source: KSCC, 2004

This coupled with the realization that the Gulf markets are more or less cut off from global developments, other than within the oil sectors, made the vision of transforming Dubai into a central financial market that is able to integrate the regional bourses to “enable investors to trade on each one, reduc(ing) volatility and boost(ing) liquidity” (Mc Sheehy, 2006), and expose the GCC markets to the world, a pressing issue.

The state of Dubai encouraged first by its geographic location, its co-ordinance (between 55° 16 East and 25°16 North) place it approximately seven hours away from London on

³ The newness of the DIFX is the reason behind undertaking a descriptive analysis, instead of a quantitative one. Too few transactions have yet happened, making it impossible to acquire the necessary data to undertake a theoretical or empirical study of the exchange.

one side, and Hong Kong on the other side (Dubai department of tourism website). And secondly by the boom it has been going through, has embarked on projects to become the regional hub linking East to West.

The push for improvements in the financial sector came from growth in the real economy, demand following hypothesis of Patrick (1966) from Calderon and Liu (2002), as well as the realization that a well designed financial market was needed to maintain this growth, the supply leading hypothesis (Calderon and Liu, 2002).

All this, and the fact that until it went live, there was no international exchange in the Middle East region bridging the gap of financial flow, were the main drivers behind the DIFX's conception (DIFX, 2005).

The first step in the creation of the DIFX was an approval of the draft of the federal stock exchange law by the federal cabinet at the end of June 1999. The draft law foresaw the establishment of a Securities and Commodities Commission which will have the authority to license trading floors. The exchange is to have electronic trading based on the two floors in Abu Dhabi and Dubai. The DIFX is a limited liability company located in the free zone region of its sole shareholder, the Dubai International Financial Centre (DIFC), and is regulated by the Dubai Financial Services Authority (DFSA). It was conceived on 29 September 2004, opened a year later on 26 September 2005, after receiving the license, and was fully operational on the 31st of December of the same year. Initially there were only four members on the board, Credit Suisse, Deutsche Bank, HSBC, and UBS AG. That number however quickly increased to 40 by the end of 2006, and market capitalization reached US \$50 million.

Although the government and central bank are still in the driver's seat of the economic vehicle, measures have been taken to achieve higher levels of financial liberalization, with the creation of the exchange as an important step towards having a free market economy.

The three main values guiding the DIFX's culture are: integrity, transparency, and efficiency. Integrity shows adhering to high moral principles and professional standards, while transparency standing for clearness, simplicity, and lack of ambiguity, is stressed to help build trust. Efficiency on the other hand is included to show the intent to constantly find ways to reduce frictions and costs. Implicitly, the three values also depict how the

DIFX is going to help in performing the functions of mobilizing savings and facilitating the exchange by reducing costs through efficiency, and the functions of providing good access to information and corporate control by ensuring transparency and integrity. In addition the mission statement of the exchange, which is “to stimulate economic progress by providing a unique forum for international and regional issuers, investors and intermediaries” (DIFX, 2005), stipulates possibilities for performing the functions of risk reduction and financial integration.

Some advantages that the DIFX offers compared to other exchanges in the region are (KSCC, 2005):

- Unlike most stock exchanges in the Middle East, there are no restrictions on foreign ownership of shares, and foreign banks can be brokers or members. Reflecting an international out reach.
- International standards, comparable to the Hong Kong exchange and NYSE, are followed improving image and trust.
- Higher liquidity and diversification achieved, by employing Market makers, creating DIFX indices, and including new product markets, for example the Islamic alternative securities. All helping in mitigating the liquidity and default risks.
- Family businesses need to offer only a 25% stake to list. This will increase the number of listed companies, given that a large number of businesses in the Middle East are family owned. It might however reduce the element of corporate control since the threat of forcing a change in management is less applicable.

7.1 DIFX infrastructure

This section will give an overview, setting up the discussion of the exchange’s basic design components, and the link to performing the six growth related functions. The design components will be explained in more details in the sections following, and are grouped within the three classifications, Rules and regulations, Market model, and DIFX Financial indices.

In the theoretical background section, about the stock markets above, it is mentioned that there are two types of exchanges, the physical exchange and the over the counter or

electronic exchange. The Dubai International Financial Exchange can be considered a hybrid stock exchange. It is fully electronic using the AtosEuronext Market Solutions NSC System, while also allowing the operations of Market makers in the listed securities, thus it is both order and quote driven. As a matter of fact Merrill Lynch on February 6, 2007 became a Market maker for Hikma Pharmaceuticals plc securities, offering continuous buy and sell prices. There are a number of different securities traded including equity products, income products, Islamic products, funds, and index certificates. For a list of these product types and the obligations posed on firms for dealing in a specific type, please refer to Appendix I.

The exchange was established on a custom built regulatory and physical infrastructure, focused on accommodating the financial services industry. Its hybrid architecture is similar to that of the New York Stock Exchange. Shares are allocated to specialists (Market makers), acting as brokers on commission, as well as buyers and sellers for their own account to ensure market liquidity. The usefulness of this system is in its ability to manage crises situations. For example following President Eisenhower's heart attack, specialist on the NYSE "holding stocks worth \$50m, bought almost another \$50m to help stabilize the market" (Valdez, 2007). In this respect the brokers reduce the liquidity risks. By using the automated system, the DIFX's design reduces transaction costs and eases the transfer of information, performing the function of facilitating the exchange of securities, and thus helping growth. Especially since investors do not need to be connected to specific terminals to trade, rather the exchange offers technical support for members to create their own trading front-ends, also known as graphical user interfaces (GUI). Furthermore by being the intermediaries that collect the savings, representing the investors, and bring them to those in demand for capital, the brokers perform the function of savings mobilization.

On the DIFX there are currently three indices in operation, with their main objective to act as a benchmark, or a 'yard stick', that is representative of market sentiments. These three indices are the DIFC Arabia Titans 50 Index, FTSE DIFX Index, and the ML Investable Index.

Support for the operations of the exchange and trade is provided by three basic components. First the DIFX Clearing House, which facilitates the transfer of ownership

of securities, manages and enforces margin requirements, and reports trade data. Secondly the DIFX Registry system, which contains the formal records of information on shares movements of the listed companies. And finally there is the Central Security Depository, which acts as the financial institution providing custody for securities (DIFX, 2005). The support for growth that these components offer can be summed up as performing the functions of: facilitating the exchange, through the transfer of ownership; imposing corporate control, by monitoring margins; mobilizing savings, by offering a secure depository; and improving transparency, through data reporting and the functions of the registry system.

Finally there are two broad sets of rules and regulations governing operations on the DIFX, the listing rules and the business rules. The first are used to delineate the process by which a firm's stocks qualify to trade on the exchange and any future obligations it faces. The second set defines the process of becoming a member, the clearing and settlements arrangements, and the responsibilities towards clients. These rules and regulations will be described in more details in the sections following.

Therefore, in a few words, the main ideas that can be taken from the DIFX infrastructure section are that, the DIFX is a mix of an electronic and specialist exchange, it is a hybrid. Brokers reduce risks, and perform the function of savings mobilization. The automated system reduces costs and speeds transaction rates. There are three indices in operation, with the main function of representing market sentiments. And finally the support functions are provided by three structures, the DIFX Clearing House, the Registry system, and the Central Security Depository.

8.0 DIFX rules and regulations

Operating in a developing country with little experience in the world financial markets, and aiming to become an international financial exchange, implies that a rigid and flawless system of regulations needs to be in place. This is not just to gain trust, but also to build and retain it over the years, to protect investors from fraudulent activities, and to improve the operations of the financial market increasing economic returns. This in turn will encourage more savers to deposit their money into the market, improving the function of mobilization of savings.

There are two general headings grouping the rules used, first the Listing rules, which define the procedures required for a company to have its securities admitted and traded on the DIFX, and the ongoing obligations involved to continue trading (DIFX, 2006a). Second the Business rules, which set the requirements needed to become a member of the exchange, the clearing and settlement procedures, and the services owed to the clients (DIFX, 2006b).

8.1 Listing rules

Most of the growth related aspects of the rules and regulations DIFX design element, come from the Listing rules, as such I will concentrate on these rules, more than the Business rules.

Companies that can list on the exchange are either those going through a privatization process, issuing an IPO, or firms already listed on another recognized exchange seeking a presence in Dubai. This possibility for simultaneous listing supports the function of financial integration, as companies, local or foreign, will be able to link their international investments to those that they carry on the DIFX. There are thus two types of acceptable listings, an IPO, and secondary listings (whether capital or non-capital raising).

The securities that are to be listed need to be:

- US Dollar denominated, dematerialized (electronic format), and with a freely transferable ownership.
- Ownership is open to all nationalities.
- Satisfying international trading, clearing and settlement standards.
- Subject to multilateral netting.

The fact that all securities are to be traded in US dollars would attract international investors, as it eliminates exchange rate risks, and the US dollar is a much more commonly used currency than the Arab Emirates Dirham. Requiring that the securities are open to all nationalities and freely transferable reduces default and liquidity risks, as it would increase the number of market participants and the frequency of transactions among them, thus performing the function of risk reduction. Satisfying internationally accepted standards will also help, as it reduces the perception of default risks, while promoting the functions of corporate control and financial integration, by making it

simpler to align the requirements between different markets. Finally imposing multilateral netting, which will be explained in more details in the clearing and settlement section below, will reduce credit risk, by minimizing the costs incurred in case of default. It will also cut transaction and information sharing costs as the trading parties will offset and reduce the number of individual positions each hold. Coupled with transactions being done in a dematerialized form, this will significantly reduce costs and improve transparency, by increasing the rate of information transfer. These characteristics will directly funnel into performing the growth functions of risk reduction, better mobilization of savings, and better access to information.

The process of listing starts with submitting a proposal involving an internal assessment of the company to decide whether or not it should list. This is because, although an IPO comes with many advantages, it does pose some difficulties, like high costs, continuous disclosure, perceived loss of control, pressure to achieve short term results, and in general more scrutiny than some firms, especially the smaller ones can handle (Dorf and Byers, 2005). Moreover the firm should have long term capital needs, an efficient information system enabling it to meet the disclosure requirements, and be prepared for adverse market affects on the share value.

After deciding to list comes the planning phase, at this point a company representative should approach the exchange, present the firm's interest in listing and show its capability to meet the responsibilities. At this point financial statements for the last three years independently audited would be submitted for the first time, which later on the firm will be required to provide on regular basis.

Phase three is the preparation phase; it starts by the firm appointing sponsors and advisors as needed, for example to trade Islamic securities a Shari'ah (Islamic law) compliance committee should be employed. Usually sponsors are also the underwriters, for example an investment bank, and their role involves:

- To insure that the directors of the firm understand their responsibilities under the listing rules, and provide impartial guidance as to the application of these rules.
- To insure that all necessary documentations supporting the application are submitted to the relevant authorities. These documents include: an application

form; certified certificate of incorporation; financial statements; and a certified agreement by the firm's board to issue securities.

- To be responsible for communicating with the exchange during the application process on behalf of the firm.

Phase four is the actual application phase, whereby an application with all supporting documents is submitted, and fees are paid. This phase includes a 12 day review period after which the issue is either approved or rejected. If approved the firm's stocks will be admitted to the market list and trading commences.

To continue trading the firm's board needs to ensure the continued adherence to the DIFX disclosure regulations. These involve informing the market without delays of any price sensitive information, as well as the timely (no more than 90 days of the year end) reporting of annual financial results. It should be noted that as long as the firm is listed it needs a sponsor, and in this case the responsibilities involve assisting the firm in complying with the rules, and satisfying the continued obligations, as well as notifying the firm of any failures to comply.

Therefore the listing process has been designed to ensure the membership of only those genuinely interested and capable firms. The proof of an internal assessment, long term capital needs, and technological resources offering proper disclosure, will help improve the quality of listed securities, and boost transparency and the level of information access, thus having a positive affect on all six growth functions. The greatest influence on growth comes from increasing the probability of capital in the market going to productive long gestation period projects, thus improving the pace of technological enhancements. Further on, obliging the regular disclosure of independently audited financial statements will improve the function of corporate control. While the requirements involved permitting the firms to continue trading and imposing sponsors, are mainly geared towards performing the function of providing better information access to market participants.

8.2 Business rules

The Business rules define what firms should have in place if they want to become a member of the exchange. These rules also explain the services owed by the members to

the exchange's clients. As minimum requirements to qualify for application, firms have to satisfy the following conditions:

- Be an authorized, licensed and recognized firm.
- Can satisfactory prove it has efficient management, control systems, and directors to ensure continued adherence with the set rules and regulations.
- Should provide details of the technical and personnel resources that are allocated to manage the responsibilities of the firm as a trading member.

The continued obligations of the members after admittance involve:

- Complying with all contracts and clause agreed upon with the DIFX.
- Continue holding a commercial license permitting the firm's operations.
- Maintain enough staff, knowledge, and resources to be able and manage the responsibilities imposed as a member.
- And finally to refrain from any conduct that can cause harm to the DIFX, or other members.

To sum up, for the DIFX to operate properly and maintain trust, comprehensive rules and regulations are needed. These can be grouped into two sets, the Listing rules, and the Business rules. The first clarifies the requirements for a company to be admitted into the exchange, while the second states what is needed for a firm to become a member.

As explained in the section, the rules that are in place support the functions of, financial integration, risk reduction, corporate control, mobilization of savings, and better access to information. Furthermore, after being admitted into the DIFX, a firm is required to hire a sponsor, and to offer suitable disclosure.

9.0 DIFX Market model

The purpose of this section is to explain how the Dubai International Financial Exchange organizes the constituents of its market model design component. They consist of: trading; clearing, settlement, collateral and margin requirements; and the operations of the central security depository and the share registry. The market model was designed with the aim of being efficient, reliable, and customer oriented, using “state- of the art technology” (DIFX, 2006c). This section will thus also explain how the design of the market model, as an aggregation of the designs of its three constituents, has a direct

impact on the ability of the DIFX to offer the six growth related functions: mobilization of savings; risk reduction; better information access; improved corporate control; facilitating the exchange; and support for financial integration. Which in turn affect the accumulation of savings and the rate of technological enhancements. For a graphical representation of the design of the DIFX market model transactions flow, please refer to appendix II.

9.1 Trading

The Dubai International Financial Exchange offers its members a one stop solution for their trading, settlements, and clearing, using the European based AtosEuronext system, hosted from Paris. The trading is an anonymous, order driven, fully electronic process. It is also supported by Market makers which act as intermediaries, creating a market for the listed securities they represent. These elements of the trading process, the electronic platform and Market makers, will be emphasized in this subsection.

Members are not required to connect to a central trading terminal; rather the system, by means of an Application Program Interface (API), offers the option of using individually tailored trading front ends. Regionally however the DIFX recommends the use of a central trading terminal it provides based on GL WIN system. A complex and holistic trading platform in use in New York, Paris, and Tokyo and is provided by GL Trade (DIFX, 2006c). Recently connectivity has become even easier with the introduction of the Financial Information eXchange (FIX) protocol. It is an open ended, industry acclaimed, standard for financial communication, offering access to a large number of trading partners connected to a single network.

Trading commences from Monday to Friday meaning that the exchange follows international rather than local markets, since the working week in the United Arab Emirates is from Sunday to Thursday.

To allow for better monitoring and control against fraudulent activities, a trading day is divided into the seven sessions described below. This division permits the exchange authorities more flexibility to intervene and adjust irregularities in the market, supporting fair, orderly, and efficient transactions. The trading sessions are (DIFX, 2006c):

- Consultation phase: Exchange officials monitor the market, and decide upon any necessary adjustments.
- Pre trade session (15 minutes): Trades are entered, but none are yet executed.
- Opening auction: The system executes orders placed in the Pre trade session. No modifications, cancellation, or new orders can be made at this stage.
- Main trade session (six hours): After the auction is complete, trading takes place in a continuous manner, till the Pre closing Phase.
- Pre closing Phase (five minutes): Orders are entered, but none are yet executed.
- Closing auction: The system executes orders placed in the Pre closing phase. No modifications, cancellation, or new orders can be made at this stage.
- Trading at last (10 minutes): During this session only new orders can be entered, and will be matched at the closing price.

During these trading sessions, running in the background, two automatic safeguard systems protect the trading process by preventing evident errors and extreme volatility. The first is the ‘Static price thresholds system’. It imposes a daily price ceiling and floor for each traded instrument, determined during the Consultation phase and applied to the Opening and Closing auctions sessions, where there is no continuous trading. This system safeguards against large price movements over a single trading day. The second is the ‘Dynamic price thresholds system’, which is similar to the first, but is applied to the sessions with continuous trading, specifically the Main trade session. This one safeguards against large price movements between consecutive trades. Both systems work by freezing trading on the instrument whose price breached the specified limits. The reasons behind the breach are then investigated and fixed, and an auction will be announced by the exchange to determine the instrument’s new price (DIFX, 2005).

The auction system is designed to follow a set of rules sequentially until the contested security price is determined (DIFX, 2006c). Each time more than one price is reached the system will move to the next rule:

- Rule 1: Maximum execution principle: The set price is that with the highest executable volume of trades. Is determined based on the orders placed in the Pre trade session. To increase liquidity, market orders are given priority over limit orders.

- Rule 2: Minimum surplus: Here the security limit is taken into consideration, with preference given to that with the minimum surplus. In other words the price of the security with the most volume traded (executable volume) after the limit is accounted for, will be the auction price.
- Rule 3: Market pressure: Under this rule the demand and supply conditions in the market for the security determine the auction price. If supply exceeds demand the lowest possible price is taken, but if demand is above the supply the highest possible price is taken.
- Rule 4: Reference price: If rules 1 till 3 cannot offer a single auction price for the security, then the price closest to the reference price will be used. The reference price is the closing price of the security from the previous business day.

To explain how such a trading system design can support the exchange in achieving the six growth functions, I will start by analyzing the influence of using an electronic marketplace in the exchange, afterwards I will attempt to do the same for the use of Market makers, and show how both components of the design link to supporting growth.

9.1.1 Electronic trading platform

In any market buyers face substantial costs in the process of searching for and identifying products' prices and availability. These costs will automatically cause frictions as they "introduce inefficiencies into market intermediated transaction(s) and detract from the ability of markets to provide an optimal allocation of productive resources" (Bakos, 1991). The main advantage of electronic exchange systems is their transparency. They clearly show all of the market orders and prices people are willing to buy at or sell for. They also cut down the costs that dealers have to pay to get information, costs that if high enough can cause prices in the market to become monopolistic. This is because each seller will increase the price of the security, above its normal mean level, expecting that the buyer would prefer to pay the premium, rather than embark on another costly search. Eventually greedy sellers will keep on increasing prices till their maximum monopoly levels.

Following Bakos's (1991) approach, I would like to study the benefits drawn from the adoption of an electronic system on the DIFX, by presenting the market from two views, a commodities market view and a differentiated market view.

A commodity is an undifferentiated product with a value, and traded on basis of price. Examples include government bonds or Islamic Sukuks. International investors (with internationally diversified portfolios) would likely view securities on the DIFX as commodities. This is because one of the characterizing disadvantages of developing countries exchanges is the volatility contagion that listed stocks transfer among each other, as described in the study of firm specific risks in developing countries done by Morck et al (1997). The large swings the market goes through due to price movements of some specific stocks is evidence of this, the most recent being the minor crash of the Dubai exchange on March 20, 2007, caused by a drop in the value of Emaar stock. Developing country exchanges are thus unattractive to international investors seeking to conduct inter-market trades as the systematic risk is quite profound, meaning that the quality difference between individual stocks will not matter. International investors would thus include the DIFX to hedge against systematic risks they face in their own local markets. A simple example is a US investor buying shares of a Dubai based company to hedge against the risks of increase in oil prices. This international investor will most likely have little knowledge about the UAE market, and his main concern is that, when the oil price rises causing him to lose on his US investments, the gains from the UAE market (being an oil producing country) will off set the loss. To this investor the costs involved in buying a security on the DIFX, might be the decisive factor. Compared to buying it on say the Saudi Tadawul exchange, which is an exchange of another oil producing country. In which in commodity markets "buyers will typically choose the seller with the lowest total cost, which will usually include the price paid to the seller plus any search...costs" (Bakos, 1991). Treating the exchange as a commodities market, the gain from the electronic feature is that: by reducing the costs of searching and by offering easy access to the products and prices in the market from different sellers, it will prevent monopolistic pricing thus reducing costs and improving buyers' welfare; making the DIFX more attractive to international investors.

Unlike international investors, local (GCC) investors will likely view the DIFX as a differentiated products market. This is because these traders often have enough market knowledge and local experience, for specific stock features to influence their decisions, and furthermore these investors are seeking to diversify the non-systematic risk. In differentiated markets the search process is even more complex, as buyers need to consider prices and also product features. A good model to represent these costs is the “unit circle” or “city around the lake” model (Bakos, 1991), in which buyers face a cost to get informed about the product features they are interested in, and then decide upon that information and the cost already incurred to buy, keep searching, or just exit the market. As the search process becomes more effective, buyers become more demanding with respect to finding a product close to their needs. As such the benefit of cost reductions, achieved by the electronic exchange, in a differentiated market is that: the buyer will have more information at the time a decision is to be made, thus making a better choice, resulting in the highest levels of efficient resource allocation (Bakos, 1991).

Therefore the benefits of an electronic, order driven market, is first that they help in preventing monopolistic behavior. This is done by increasing the competition between sellers, performing the function of mobilization of savings. They also offer easier, faster, and cheaper access to information, performing the function of better information access. And finally by allowing for a better choice with respect to the savers allocating their investments, they perform the function of facilitating the exchange.

9.1.2 The Market makers

Market makers are exchange member firms that act as the last resort buyers and sellers of securities. The NASDAQ exchange glossary describes Market makers as member firms that buy and sell (listed) securities at prices they display, for their own account. And the International Organization of Securities Committee defines Market makers as “participants in quote-driven financial instrument trading environments that fulfill the function of generating bids and offers. They create liquid markets by consistently quoting buying and selling prices, thereby ensuring the existence of a two-way market” (International Organization of Securities Committee, 1999). As such Market makers,

literally make a market for a security, by being ready and able to buy or sell that security at a quoted bid/ask price, even if no actual demand or supply exists at the time.

Panayides and Charitou (2004), divide markets' design with respect to the use of Market makers into four groups: Market making (dealer) system in a quote driven, electronic market; centralized market making system in an order driven, floor based market; centralized market making system in an order driven, electronic based market; and non-centralized market making system in an order driven, electronic based market. The use of Market makers in the trading design of the Dubai International Financial Exchange can be considered a non-centralized market making system in an order driven, electronic based market. With Market makers required to: have a bounded bid/ask spread; to ensure the minimum trading volume determined by the exchange for the securities assigned to them; and to do so within specified inter-quotation time limits. Moreover the exchange appoints which securities are to be represented by each Market maker, as there is more than one. In return Market makers receive a discount on fees, but do not have any monopolistic privileges with respect to price dissemination information, or order priority (DIFX, 2006a). The result is that Market makers increase liquidity by competing with the investors for orders, rather than just having competition among themselves which might cause collusions springing out⁴.

The main advantage of this design is the high level of transparency offered to all market participants, which prevents excessive control by any party. In addition to better and cheaper market surveillance, as the responsibilities of Market makers are predefined as rules that can be monitored and controlled electronically. Another cost saving implication of this system design is the ability to link to the Market maker "through a terminal similar to any other investor, there is no need for extra technical or human resource to monitor their trading role" (Panayides and Charitou, 2004).

Market makers offer several advantages to an exchange; they increase liquidity, lower transaction costs, diminish volatility, lower bid/ask spreads and improve the daily turnover of securities. As Mr. Nasser Al Shaali, Chief Operating Officer of DIFX,

⁴ I refer the reader to the events of May 24, 1994. Where more than a 100 NASDAQ Market makers were accused of collusion. An investigation by the Securities and Exchange Commission, that lead to settlements worth up to \$1bn, was prompted by the study of professors William Christie of Vanderbilt University and Paul Schultz of the Ohio State University.

explains: “liquidity is expected to be further increased by the introduction of the Market makers, which exist on no other exchange in the Middle East” (DIFX, 2005).

An important observation is that these affects apparently manifest themselves more in markets of developing countries (Panayides and Charitou, 2004). A study conducted on the Euronext Paris exchange (Mann et al. 2003), to which the Dubai International Financial Exchange is affiliated, confirms this.

Having a hybrid design combining both an electronic exchange platform and Market makers, enabled the DIFX to benefit from the advantages of both systems. The electronic broker feature reduces costs, offers more transparency, anonymity, and speed; while the Market maker, in addition to the advantages mentioned above, collects market information better than the individual investors, which means they can make use of the bid/ask quotations placed by the Market maker as a benchmark. Albuquerque (2001) distinguishes two types of information in the market: one about price quotations, and the other about market trends. She concludes that the electronic feature of the exchange has an advantage with respect to the first, while the Market maker is superior, when it comes to the second. The reasons behind her conclusion, she explains, is that the electronic feature offers a faster access to large amounts of information, while the Market maker has a more personalized interaction with clients, getting a better feel about the true intentions behind making an order.

With respect to the influence on the growth functions, from the above one can concluded that the design of the trading process of the DIFX provides flexibility to international investors, by making the link to a specific terminal not necessary, since investors can use their own trading portals. This facilitates the function of financial integration. International investors expenses are also reduced by not having to pay new installation costs as they can incorporate the trading to existing systems, as well as using the cheaper electronic trading platform. This will attract international investors, especially those that view developing countries’ markets as commodity markets, which in turn performs the function of facilitating the exchange, as there will be a larger variety of traded items allowing for higher specialization. The use of safeguards, and dividing intra-day trading into seven sessions, allows for better monitoring of the trade, performing the function of corporate control and regulations. This division will also increase efficiency by adjusting

for any irregularities, thus transferring a larger portion of the savings into investments performing the function of savings mobilization. The electronic platform by offering higher transparency enables the design to perform the function of improved information access. In which it gives a comprehensive market view to traders quickly and cheaply, resulting in them making a more informed choice about the quality of a security and increasing the likelihood capital will go to higher return projects. By making the search process simpler, the electronic access also performs the function of facilitating the exchange. This is achieved by making it easier for those with a demand to find supply, and vice versa. Moreover by using the Market makers' ability to link traders who lack mutual credit lines the performance of this function is further enhanced.

The fact that Market makers diminish the bid/ask spreads is directly linked to performing the function of savings mobilization. In which a reduction in the spread, resulting from the higher competition, caused by Market makers also competing with investors for orders, will push costs (prices) away from monopoly levels, causing a smaller portion of savings to be lost as frictions and more going to investments. By increasing liquidity and turnover Market makers perform the function of risk reduction, by reducing the liquidity risks. Whereas the electronic base of the market making system, will allow the exchange to impose a set of standard regulations, that can be easily monitored, to which the Market makers have to comply, facilitating the function of corporate control.

To close briefly, the aim of this section was to demonstrate how the DIFX's market model elements are organized. Trading is an automated order driven process that is supported by Market makers. It follows international trading hours, with a trading day divided into seven sessions. Two safeguard systems are in place, preventing large price movements between consecutive trades, and over an entire trading day. Electronic trading offers transparency, reducing monopolistic behavior. Market makers create a market for a security, even if no actual demand or supply exists at any given time. They offer higher liquidity, lower transaction costs, and improve daily turnover.

By performing the functions of, financial integration, facilitating the exchange by bringing supply closer to demand, mobilizing savings, risk reduction, better information access that ensures a higher return for investment, and improved corporate control which

increases market efficiency. The design of the trading system on the DIFX improves the accumulation of capital. On the other hand by performing the functions of, facilitating the exchange which enhances specialization, and better information access allowing investors to identify new innovations, the design will also increase the pace of technological progress.

9.2 Clearing process

This section will first describe the design of the clearing and settlement system, and the collateral and margin requirements system, currently applied on the Dubai International Financial Exchange. Then will link the benefits of such a design to supporting the six growth functions.

9.2.1 Clearing and settlement

The settlement is based on a T+3 process, whereby settlements are cleared within three days of trading. The clearing system used is the eClearSettle Clearing and Settlement, which was developed by the Indian based Tata Consulting Services (DIFX, 2005). The functions of the clearing members, working in coordination with the exchange's clearing house, involve clearing and guaranteeing the quality of the executed trades. This is to be done for their own account, for their customers, or for the other trading members that need to be linked to a clearing member to execute their transactions on the DIFX platform. Clearing members are offered the possibilities to query the exchange trading system, check their updated obligations towards the DIFX, and compare positions against their own records on a real time basis. This is expected to minimize the pressure on the DIFX during a settlement day, as it will reduce the number of queries received simultaneously, allowing for a faster rate of trade executions.

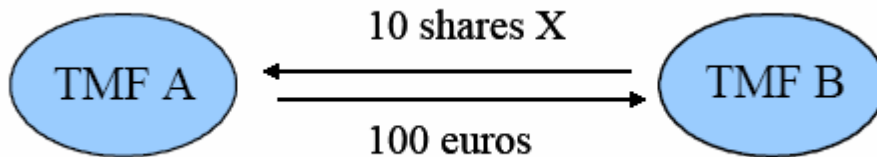
The exchange acts as the Central Counter Party facility (CCP). Whereby for every transaction, the exchange by the process of novation⁵, will replace the debtor for every creditor, clear the transaction, and then offer the securities for trade on the market. Generally speaking a “Central Counter Party is an entity that interposes itself between transacting counterparties – a seller *vis-à-vis* the original buyer and a buyer *vis-à-vis* the

⁵ Novation is the process of replacing one member of a contract with another member. The consent of all contract members is usually required.

original seller – to guarantee execution of the transaction” (Ripatti, 2004). As such the “DIFX becomes the buyer to every seller and seller to every buyer and thus guarantees the performance of all trades” (DIFX, 2005). Figure (E) below, is an example of the difference between using and not using a CCP.

Figure E: Example of clearing with CCP and without CCP

Clearing without the CCP



Clearing with the CCP



Source: Ripatti, 2004

Note: TMF: Trading Member Firm

CMF: Clearing Member Firm. With CCP TMF transact with the DIFX through a CMF.

This Central Counter Party facility implies that traders face lower risks with respect to finding a buyer or seller, but will need to pay a premium for the service. The DIFX protects against default risk by demanding strict margin requirements. Before a settlement occurs the exchange calculates any change on the member’s margin for the unsettled positions, and requires this amount to be covered by collateral, which is not necessarily cash. However, if the margin requirements exceed the amount of collateral already in place at the clearing house, a margin call will be issued to be covered in cash only, and on the same day the call is made.

The settlement process and the margin calculations are done using multilateral netting, resulting in each member having only one transaction to be settled per International Security Identification Number (ISIN) on each securities settlement pool (SSP) they maintain (DIFX, 2006c). The way multilateral netting is done, is that the exchange

system collects all transactions on a certain ISIN within a clearing member's pool, combines them, and gives a netted position for each SSP account. In other words "clearing members are permitted to net together their long and short positions of different clients and only post the margin on aggregate net positions" (Ripatti, 2004).

Refer to Appendix III for an example of the multilateral netting calculations.

9.2.2 Collateral and margin requirements systems

Margin calculations are done to measure the risk exposure of clearing members' outstanding positions. DIFX uses the Value-at-Risk (VaR) model to estimate this risk exposure. The two security dimensions considered are, trading horizon, and probability of default. The exchange uses a VaR at a 99% probability on a one day horizon, which explains the maximum expected one day loss that will be exceeded on only one percent of the days. For example, if we have 360 trading days, the value of a 99% VaR on one trading day, is the amount of loss that will be exceeded on only 3 or 4 days (1% of 360).

Using the results of the VaR measures, the exchange imposes an initial margin on each member. This will equal the maximum cost to be incurred by the exchange's clearing house if the clearing member in question defaults, leaving the clearing house to buy the stock. The value of the stock for the initial margin calculations is based on its closing price and re-evaluated daily (DIFX, 2006c).

For fixed income securities, like government bonds, corporate bonds, or Sukuks, the margin is calculated as a percentage of the outstanding fixed income securities' value of the clearing member, and it is based on:

- Category of issuer: Risk level varies according to whom is the issuer, for example government bonds require a lower percentage than private sector bonds.
- Ratings of the security: Within a specific issuer quality category, the risk and thus the percentage as a margin will vary depending on the security's rate. An AAA will require a lower percentage than an A security.
- Time till maturity: Longer time till security expiration demands more percentage of the value as margin. Reflecting the higher risks involved in longer maturity securities.

Whether dealing with variable or fixed return investments, margin calculations are undertaken to determine the amount of collateral that the trading members should put up

with the exchange. The DIFX allows for the use of two types of collateral, other than cash, which are bank guarantees, and DIFX listed securities. However the exchange still demands at least 25% of the collateral's value to be in cash.

The many benefits of a Central Counter Party (CCP) have encouraged its adoption in financial markets generally and exchanges particularly. The CCP offers higher potential for participants profiting. That is the anonymity it ensures helps market participants benefit from information they possess, this coupled with the use of an electronic platform, which is the case for the Dubai exchange, provide a strong incentive for participants to search and collect information. In turn this will result in a larger number of more informed traders that have a higher chance of identifying the most optimal investments with good growth and return. This element of the design thus performs the function of better information access. The use of an electronic exchange makes it very difficult for participants to manage counterparty risk by choosing a specific counterparty; through the process of novation the CCP is able to perform this by offering more certainty in the market through managing and redistributing the counterparty risk (Ripatti, 2004). The result is a reduction in the default risk, as trade counterparties are better matched, and thus performing the function of risk reduction. In addition, the improvements in market efficiency that the CCP allows will narrow the trading spreads. Together with transforming bilateral risk exposure between sellers and buyers into a single exposure, will attract a larger number of trade activities to the exchange. The result is an increase in liquidity and number of transactions (Ripatti, 2004), which imply performing the function of facilitating the exchange as more trades occur. On the costs side, the standardization that a CCP facility imposes will increase straight-through-processing⁶, which coupled with the netting, will reduce the costs clearing members have to pay. This will result in an improvement in the function of mobilization of savings, due to fewer frictions that cause the waste of savings. Having a Central Counter Party will also help in the function of financial integration by getting the regional markets together, in which “economies of scale and network externalities seem to favor a high degree of concentration” (Ripatti, 2004). Something that the CCP, through the wide-ranging

⁶ The use of standardized documentation and market processes

influence that it exerts on the market, with respect to improving stability, standardization, and use of collateral, can provide. This is strong support to the idea of creating a single market with a single Central Counter Party facility, especially since after 2010 a common currency should be in use among the GCC countries. Moreover the multilateral netting process used on the DIFX will reduce the number of transactions involved in the cross border financial flows, which in turn will cut down the foreign exchange transaction costs. Both these DIFX design elements are pushing to create clearing arrangements that are more consolidated and cost effective, similar to those in the developed world (Ripatti, 2004). Therefore the exchange performs the function of financial integration, through supporting the creation of a single CCP, and the function of mobilization of savings by minimizing the fraction of the savings lost to cross border financial flow costs.

Hence by performing the function of risk reduction, by managing and distributing the risk within the market, and the function of mobilization of savings, by reducing frictions between local and international transactions, the design elements described here encourage savings, therefore improve the growth related accumulation of capital. Whereas the pace of technological enhancements is amplified by the fact that the better information access offered by the exchange's design will increase the likelihood capital goes to productive projects. As well as the fact that performing the function of facilitating the exchange, due to the increase in the frequency of trading, allows for more specialization.

Therefore, concisely, clearing members working in coordination with the exchange's clearing house, clear and guarantee the quality of executed trades. The exchange is the CCP, guaranteeing the performance of all trade activities. Margin calculations are done to determine the amount of collateral each trading member should put. For most securities this margin is calculated using the VaR model, however for the fixed income securities, the margin is a percentage of the value of the securities held by the clearing member.

The clearing process design, as shown above, reduces risk by managing and distributing counter party risks. Provides better access to information, by giving traders an incentive to search for new information. Facilitate the exchange by attracting traders, due to the improved efficiency. Finally, it increases the possibility for financial integration, by offering stability and standardization.

9.3 Registry and Central Security Depository

The Dubai International Financial Exchange created a Central Security Depository (CSD) with the function of holding clearing members' securities as a nominee on their behalf, till they are cleared with the exchanges Central Counter Party facility. As such the function of the CSD is to manage the after trade activities of transferring securities and cash between trading members after a transaction is undertaken. The securities are held in a dematerialized form, with all settlements and transfer of ownership done electronically and on a T+3 basis. The CSD is SWIFT transfer compatible as well (DIFX, 2006c). This SWIFT design capability allows participants to trade on the Dubai International Financial Exchange using securities stored in foreign depositories, as well as to trade on foreign markets using securities held on the DIFX Central Security Depository. Therefore it offers the possibility for exchange members to hold all their securities on the Dubai CSD, and through it, trade with foreign markets.

The clearing house, in order to ensure the successful execution of transactions, sets a reservation date for members' securities held at the depository. Clearing members are then responsible to ensure a sufficient securities balance is available in their respective accounts at the CSD, before this set reservation date. The eClearSettle system is used to run the Central Security Depository and the Registry.

9.3.1 The Central Security Depository

In the Central Security Depository, exchange members hold securities for their customers in the form of collective accounts known as omnibus accounts. They are accounts that contain many securities for the different clients of a member, within one account or in one "book".

The main functions of the depository include the following (DIFX, 2006c):

- The settlement function: The Central Security Depository supports the settlement function by holding the securities to be transacted. Each clearing member should have a Securities Settlement Pool account with the depository. And should insure that the required security balances are available in the pool by the reservation date deadline, in order for the CCP to under take their transactions. It should be noted here that the system used is a delivery versus payment, where a transaction is complete, with the delivery of securities, only after cash payments have been

confirmed within the three days trade cycle. Otherwise the defaulting member is penalized by the exchange for the delay.

- Facilitating Over the Counter Transactions (OTCs): OTC trades are those that are done (negotiated) outside the electronic trading system. The CSD facilitates these transactions for all participants, whereby trade details are inputted into the system, and upon confirmation, the transactions are executed. OTC trades can be for cash payment, or free of payment where securities are exchanged similar to a barter system. In both cases the transfer is based on gross amounts, without any deductions for transfer costs or taxes. The trades can be done either using the Dubai exchange graphical user interface, or through SWIFT account transfers.
- Pledge Facility function: Central Security Depository members can pledge securities they hold with the exchange, as collateral against loans taken from other exchange members. If the loan is settled the pledge will be closed, otherwise the CSD transfers the collateral from the pledgor account to that of the lender's.
- Initial Public Offering (IPO) handling: All IPOs take place through the CSD. The Lead manager (often a bank) registers the new stocks with the CSD and their respective new owners. The issuing firm's account is then credited for the sale of the IPO by the CSD.

9.3.2 The Shares registrar

The registrar is an authority responsible for maintaining the records of stocks and issues of listed companies. All companies wanting to trade on the exchange have to register first. A main function of the registrar is to ensure that the number of shares listed for a specific company matches the number of shares that the company has authorized for trading. On the Dubai exchange the registrar is involved in the following (DIFX, 2006c):

- Registration of shares: The issuer company registers its shares on the registrar records along with legal details including, the name of the owner, the number of shares, and dates.
- Processing of Corporate action disbursements: Issuing firms can authorize the registrar to undertake the transfer of cash or securities disbursements on their behalf, as part of corporate action entitlements, to the bank accounts of certain registered investors. The exchange encourages registered firms to use its Central

Security Depository to hold these disbursements, by not charging any fees on such transactions. As they can be directly routed via the CSD using SWIFTS.

- Accounts holdings and transfers: Investors that wish to own and hold securities for a longer period of time have to register as “direct holders” with the share registrar. Investors that want to own and trade securities on a short term, hold these securities with the CSD. Using the registrar’s graphical user interface, investors are also able, through their terminals, to transfer securities’ holding between the registrar and the CSD, as well as securities ownership.

Although it might seem that the functions of settlement and holding of securities to later on transfer its ownership, as a result of a transaction being cleared, can be done physically between the trading parties. The numerous participants undertaking transactions and the resulting large number of trading volumes deem the physical handling of securities and the exchange of certificates as means of transferring ownership, futile. As such a major benefit of using a Central Security Depository is the automated dematerialized transfer of ownership that maintains efficiency, and cuts costs. The CSD also has risk reduction implications, as described by Till (1999), from Galper (2000), they are three: the first is the principal risk, where either a security or cash has been delivered by one party to the trade, while the other still has to honor the transaction. Here the delivery-vs-payment system of the CSD reduces default risk, as it ensures closing the trade. The second is the replacement cost risk, where a trade fails to settle, the CSD finds new parties and settles the trade instead of market actors having to re-do it. The third risk is liquidity risk; where the CSD offers the advantage of minimizing delays in transaction settlements. Other benefits include the one click solution for members to transact using the CSD’s graphical user interface; the SWIFT capability attracting international investors; and the pledge facility smoothing the progress of exchanging securities and trading, as participants are able to trade using collateral even if they don’t have enough cash at a given time. Moreover the inclusion of an electronic CSD within the design of the DIFX is in direct agreement with the recommendations put forward by the Group of Thirty (G30). The G30 comprises some of the most prominent figures within the field of global securities clearance and settlement. Among its members, is the

Chairman of the Federal Reserve, the president of the European Central Bank, the Presidents of the international units of JP Morgan Chase, Citigroup and Morgan Stanley, the Vice Chairman of American International Group, and Governors and Vice Governors of central banks in industrial and emerging market countries (Walsh, 2004). This fact is more than just clear acknowledgment to the importance of a CSD; it also serves to attract international investors by promoting a credible exchange design.

To establish a link between the designs of the Central Security Depository and the registrar, to growth, I will start with the first growth related function that the CSD performs and that is the function of risk reduction. Shrinking the time it takes for a trade to be closed, increases the probability that parties to a trade fulfill their obligations reducing default risk. That is because as more time passes uncertainty and risk increase. It also reduces liquidity risk as speeding up the fulfillment of a transaction, will allow for more trades to occur, increasing over all liquidity through an increase in turnover. Even if the number of market participants is still the same. Furthermore, by enabling the clearing house to reserve securities held on the CSD to be traded, the design reduces the principle risk and replacement risk, by minimizing the costs incurred to find a new party to a given trade in case one defaults.

Choosing a design where the securities are held in a dematerialized electronic form, cuts down costs. For example there are no storage costs, no delivery costs, and no need for any printed material. These lower costs incurred by the exchange will mean less costs are charged for the service of clearing. As a matter of fact, investors pay no taxes for income return on securities held on the CSD. This design element then helps growth on the one hand by reducing the amount of savings lost as frictions (transaction costs), and on the other hand by increasing the total amount of savings, since a reduction in taxes means a larger portion of a household's income can be saved, inducing more investments. Both of which perform the function of mobilization of savings. Furthermore eliminating the need for printed material such as certificates, increases the security of information, as backups or copies can be readily made, stored, and distributed as necessary, thus performing the function of better information access.

Including a SWIFT capability in the CSD design will attract foreign traders. This is due to the increase in participants' economies of scale, by allowing them to store all their

securities on the Dubai CSD and then trade internationally. This will first of all cut costs and frictions for all, performing the function of mobilization of savings, and will secondly induce foreign investors to engage in the local market as they are already part of it. Increasing liquidity and performing the function of facilitating the exchange.

The pledge facility of the CSD design influences the ability of the DIFX as a financial market, to support growth; this is done by performing the function of facilitating the exchange. In which giving the option of using collateral as trade guarantee, makes it possible to undertake transactions that otherwise would not have been undertaken, due to a temporary lack of liquidity.

The main growth related benefit derived from having a registrar, as an element of the exchange's design, is monitoring firms' activities and supervising the amount of shares being traded. This way the registrar makes sure rules and regulations are being followed, investors are getting a fair return, and that firms are not being fraudulent. Consequently performing the function of corporate control especially that it is difficult for individual investors to check the actual number of shares a given firm is trading.

By collecting the details about firms and their listed shares, and providing this information to interested traders, the registrar also performs the function of better information access.

Concerning the accumulation of capital and the pace of technological enhancements, the risk reduction function performed by the Central Security Depository will increase the accumulation of capital. This is because with less probable defaults investors are more encouraged to save (accumulate capital), in order to later employ these savings in the market and generate profits. Furthermore allowing foreign investors to use the Dubai CSD as holder for all their securities, since they can trade using SWIFT, will attract foreign savings, increasing the overall amount of capital accumulated in the economy. The ability to pledge securities also helps in improving the accumulation of capital. This is done by reducing the likelihood profitable trades are hindered, increasing profits and the incentive to save. The pledge of securities service also improves the pace of technological enhancements, as innovators lacking liquidity will be able to use this service as a possible source of capital. The fact that taxes are not paid on short term securities held on the CSD is also an incentive to save and accumulate capital.

The main deductions that can be drawn from this section, in a few words, are that, the CSD holds securities to be cleared by the CCP. The CSD manages the exchange of securities and cash between trading members, with the transfer done electronically, and SWIFT compatible. Its main functions include, settlement, facilitating OTCs, acting as a pledge facility, and handling IPOs.

The registrar holds stock information about listed companies; this is done to protect investors. Its main functions involve, shares registration, processing corporate action disbursements, and accounts transfer.

The processes of the registrar and the CSD improve efficiency and cut costs. As a result they perform the functions of, risk reduction, savings mobilization, better information access, facilitating the exchange, and corporate control, as described in details above.

10.0 Financial indexes

A stock market index generally speaking, is a listing of selected stocks and their statistics, based on the stocks characteristics and reflecting their compounded value. Often these stocks share a commonality such as being listed on the same exchange, have equal market capitalization, or belong to the same industry. Indices are often used as performance benchmarks by investors.

Most stock indices are classified within the group of ‘broad-base’ indexes. These are used to reflect the performance of the whole market, or in other words, represent investors’ opinions of the economy. Examples of these include the American Dow Jones Industrial Average, the S&P 500 Index, the British FTSE 100, and the French CAC.

There are two basic approaches used to calculate the value of indices, the price-weighted method, and the market capitalization-weighted method. In price weighted indexes, the prices of the given selected stocks, is what determines the price (value) of the index. As such any movements in the price of a stock will affect the value of the index, regardless of the size of the company it represents. The market capitalization-weighted method on the other hand, includes the size of the company in the index value calculations, in which the price of a company’s stock is weighted relative to the number of shares it has listed. So if the index represents the top fifty companies in the market “then ‘top’ means biggest by market capitalisation,” and by weighted this “simply means that a 1% change in the

price of the largest company in the index will have more impact than a 1% change in the price of the smallest” (Valdez, 2003).

The Dubai International Financial Exchange, following in the steps of other world exchanges, has incorporated financial indices in its design. Currently there are three such indices, which will be explained below, that operate in the market. The DIFC Arabia Titans 50 Index by Dow Jones, the FTSE DIFX Index by the Financial Times Stock Exchange group, and the ML Investable Index by Merrill Lynch.

10.1 DIFC Arabia Titans 50 Index

In 2004, the Dow Jones Indexes group, the Dubai International Financial Exchange authorities, and the SHUAA Capital investment bank, created the first index, that “covers the entire Arab region (and) designed to underlie investment products such as funds, exchange-traded funds, structured products and derivatives”. This is according to Mr. Lars Hamich, the managing director of STOXX Ltd, the joint venture responsible for Dow Jones Indexes business development in Europe, Asia and the Middle East (DIFX Website b).

Given that a main objective of the DIFX is to attract international investors, the DIFC Arabia Titans 50 index is a major addition to the design of the exchange. As the partnering with the world wide Dow Jones indexes, that include the Dow Jones Global Titans 50, Dow Jones Asian Titans 50, Dow Jones Tiger Titans 50, and Dow Jones Islamic Titans 100, among others, will strengthen the position of the exchange as a hub of financial services in the Middle East.

The index calculations are based on the stock prices of the fifty leading companies in the region, with the weights divided as 60% market capitalization, 20% net income and 20% revenue.

The Key features of the DIFC Arabia Titans 50 index can be described as (Dow Jones website):

- Regional coverage: The index is not confined only to the UAE market. It extends to cover all established Arab markets whose track records have proven them accessible to international investors. It currently covers the markets of Bahrain,

Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Tunisia and the United Arab Emirates.

- High liquidity of components: The component stocks of the index are those of some of the largest companies within each respective market, and are often the mostly traded. This means the index securities are highly liquid.
- Market coverage: Given that the index represents the stocks of the fifty largest companies in the Arab world, it covers a significant portion of the capitalization of the original markets from which the stocks are derived. The DIFC Arabia Titans 50 index is, as such, able to reflect the performance of these markets closely.
- Low turnover: The large size of the component firms represented by the index ensures stocks performance stability. This coupled with buffers applied to the cutoff values used to determine stocks' inclusion and removal during the review process, reduces the index turn over rate.
- Methodology: The index was constructed and maintained according to a rules-based methodology. It is almost identical to that of the other Dow Jones Titans-family indexes. Guaranteeing a high level of accurate and trust worthy results.

The methodology used to construct the index is actually based on rules that cover five areas, as well as the fact that only free floating stocks are considered:

- Index universe: The index universe is the pool from which companies are nominated for their stocks to be selected in the index value calculations. It can only include markets that are open to international ownership, and have shown good financial results for considerable periods of time. The universe currently includes exchanges in Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Tunisia and the United Arab Emirates.
- Selection list: From the index universe, companies are chosen to be on the selection list, from which only fifty will be the index components. The list is comprised of the current fifty component firms, and the fifty largest non-component firms based on market capitalization.
- Selection process: All the companies on the list are examined according to their market capitalization, taking into consideration, any foreign ownership

restrictions; their sales revenues; and their net income. The final rank for each company is assigned by weighting the market capitalization at 60%, the sales revenue at 20%, and the net income at 20% as well. The highest ranked fifty stocks are then chosen to be the index components.

- Buffer rules: These are placed to reduce the turnover of index component companies. There are two rules, the first states that if a non-component is ranked among the top 30 stocks during the selection process, then it will replace the currently lowest-ranked index component. The second rule is that, if a component company is not ranked within the top 70 stocks, it will be replaced by the highest ranked non-component company.
- Frequency of review: The index's composition is reviewed in June, once every year.

The current list of companies and weights comprising the DIFC Arabia Titans 50 index is available in Appendix IV.

10.2 The FTSE DIFX Index

The Financial Times Stock Exchange group in coordination with the Dubai International Financial Exchange, on June 2006, launched the FTSE DIFX Index series. It is the first ever Shari'ah (Islamic principles and law) and non-Shari'ah securities index, covering markets of the Gulf Corporation Council Countries (FTSE website). The securities considered within this index are open to international, regional, and local ownership, with the current index members coming from Kuwait, UAE, and Qatar.

The index series consists of the following indices (FTSE website):

- FTSE DIFX Kuwait 15 Index: Is designed for GCC and international investors. It consists of the largest 15 Kuwaiti companies, based on market capitalization.
- FTSE DIFX Kuwait 15 Shari'ah Index: Is designed for GCC and international investors. It consists of the largest 15 Shari'ah compliant Kuwaiti companies based on market capitalization.
- FTSE DIFX Qatar 10 Index: Is designed for GCC and international investors. It consists of the largest 10 Qatari companies, based on market capitalization.

- FTSE DIFX Qatar 10 Shari'ah Index: Is designed for GCC and international investors. It consists of the largest 10 Shari'ah compliant Qatari companies based on market capitalization.
- FTSE DIFX UAE 15 index: Is designed for UAE nationals, and the index comprises the largest 15 UAE companies based on market capitalization.

A key feature of the index is that it is the first in the GCC region to be designed to act as the underlying source of value for derivative products. Making the index series suitable for the creation of financial products such as, index funds, warrants, and exchange traded funds. These securities are available for trading on the DIFX (FTSE website). Only free-floating stocks are considered for index value calculations; this is to ensure that only investable securities are considered. The series calculations are based on the Industry Classification Benchmark (ICB), which is a global standard created by the Financial Times Stock Exchange group and the Dow Jones Indexes group. The index universe used for the calculation of the total index value is the five indices mentioned above, making the total index value an aggregation of the values of these indices. Screening for securities' investability is based on liquidity, taking into account free float, foreign ownership limits, and cross holdings. In which securities that do not turn over at least one percent of their issued shares, every month, for a minimum of ten month, after the application of any free float, foreign ownership restrictions, and cross holdings, will not be eligible for inclusion into the index series. In order to consistently provide an accurate market representation, the index constituents are revalued twice a year, every April and October.

The management of the index and its over shadowing authority is represented by two bodies, the first is the DIFX itself which supervises the proper listing, trading, settlement, and dissemination of information, with respect to the stocks listed on the index. The second is the FTSE International Limited, the group that built the index, and is responsible for the proper operations of the FTSE DIFX index series. This body will also store the records of market capitalization of the constituent firms, and is the one to undertake the annual reviews to select which firms will be part of the index, and which will be excluded. The ground rules used to judge which firms are to be included and

which should be dropped were designed to strengthen the stability of the FTSE DIFX index, while also ensuring the index value is representative of the market situation. As such, the rules specify that during the review periods a company will be included into a specific index series if it reaches the fifth rank or above, when the eligible securities within each relevant market are compared. It will be excluded however, if it falls to the 26th rank or below. In case the value of a constituent firm undergoes drastic movements, rendering it ineligible for inclusion, the FTSE DIFX has a reserve list for each index series. It consists of the five highest ranked non-constituent firms, from which it will then choose a replacement.

The FTSE International Limited group, based on DIFX regulations, is required to continuously declare any changes in the index constituent relative weights, and monitor the status of the index during a trading day. This is to decide whether or not there is a need for the index to be frozen and adjusted. For a list of the current FTSE DIFX index top five constituents, and the index series break down, please refer to Appendix V.

10.3 ML Investable Index

Finally The Dubai Investable Index, a very new addition to the exchange⁷, is designed to reflect the price return performance of an assortment of stocks listed on the DIFX. The selection of the stocks is based on: liquidity, market capitalization, and foreign investors' accessibility (Merrill Lynch website).

According to published reports the aim of this index is to expose the domestic Dubai market to international investors, helping them track securities they are interested in. In the future the index will be used as a benchmark to help create derivative products, based on the movement of component stocks.

Currently there are only thirteen firms represented in the index, and Table 2 below lists them.

⁷ Due to its very recent addition, there was a lack of information on this index. This is why this subsection (10.3), is not properly developed.

Table 2: Firms listed on the ML Investable Index and their weights

<u>Constituents name</u>	<u>Weights</u>
Amlak Finance	8.08%
Arabtech Holding Co	2.75
Aramex Co	2.83
Dubai Investments	8.87
Dubai Islamic Bank	23.35
Dubai Islamic Insurance Co	0.41
Emaar Properties	37.37
Emirates Integrated Telecomm	0.03
National Cement Co	0.02
National Central Cooling Co	2.55
Shuaa Capital	2.60
Tamweel	4.35
Union Properties	6.81
SUM	100

Source: Merrill Lynch Website

Besides being simple benchmarks or a means to get a relatively focused view of the performance of a market or market cycles, financial indices can be a source for the creation of a number of financial securities or instruments. One such instrument, with implications for developing countries, is index funds. These offer several advantages, in which funds that follow a financial index allow inexperienced savers the opportunity to participate in a market and profit from their savings. They can replace the need for active and costly portfolio managers or at least offer investors the means to quantify the performance of those managers, by comparing the portfolio values they produce to index values. Finally by looking at the historic fluctuations of an index value, investors can have some idea about future trends. These features, will first serve the function of mobilization of savings, because as households profit from their savings by investing in these funds they will have an incentive to save, which in turn will cause an increase in the total amount of savings in an economy. Secondly, the function of better information access is performed, through the fact that recording historical economic market performance, the index provides some information concerning future trends and return

expectations. Thirdly, the ability of investors to compare their portfolio manager's performance to the index value, is an element of the design that allows the financial markets to perform the function of corporate control, as managers are pushed and supervised to give better results. One way that this control is executed by investors is to demand that the remunerations of portfolio managers are linked to their portfolio performance compared to an index value. Investors can also control the portfolio risk exposure permitted to a manager, and ensure a minimum level of diversification. This can be done by first constraining the returns of a portfolio to a maximum deviation from the index value. And then by comparing the amount of stocks held from a certain sector to index sector investment concentrations, investors can judge whether or not a portfolio is too sector specific.

All three indices currently used within the DIFX are based on free float stocks. Meaning that the index calculations are based on firms' shares available for the public, excluding those held by governments or insiders (firm employees). Making the indices more representative of the true investment opportunities within a market. This is noteworthy, as one of the concerns for developing countries' indices is that they do not accurately reflect market environment, and therefore fail in becoming good comparison tools. The design of the DIFX indexes further tackles this problem by creating and running the indices in coordination with world known and strongly established organizations, with acknowledged industry standards, such as the Dow Jones group and the FTSE group. The fact that part of the indices is representing Shari'ah securities, that are highly specific, makes them even more useful for investors, since they cannot depend on peer group performance comparisons with such specialized securities. These design elements perform the function of better information access. Through the better market representation, which complements investors' ability to collect information and speculate on market directions and trends.

By adopting industry best practices, such as the use of free float instead of total shares, the Dubai exchange is in line with the majority of international exchanges. Moreover by offering regional and international coverage, for example the FTSE DIFX Kuwait 15 Index, the FTSE DIFX Qatar 10 Index, or the international reach on the ML Investable index, the DIFX design is performing the function of financial integration. As it allows

investors from different international markets to trade on it, bringing markets closer to each other. The higher credibility and the inclusion of regional markets expanding the capital pool available for investments will attract international participants. Coupled with the indices design offering new opportunities for households to benefit from their savings, by for example investing in stable index funds, the result will be an increase in the accumulation of capital in the economy. Since on one the hand local households are saving more, and on the other, more foreign capital is entering the market. This increase in capital will also help the pace of technological enhancements, as entrepreneurial innovations will have a wider range of resources to attract.

Recommendations

The Dubai International Financial Exchange is still very new, with market observers optimistic, but cautious. The exchange is an important and needed addition to the region. It has a fertile oil rich local and regional economy to draw money from, it is strategically located between the East and West, and is run using world class technologies.

However, it still has to prove its worth against competition from the other regional exchanges.

If the DIFX is to serve the economy of Dubai, and to support its growth, it has to attract investors, since they are the prerequisite for any financial market to operate. They are the customers, without which the DIFX will surely fail. Therefore most of the recommendations offered here will focus on improving the market liquidity, and thus performing the function of risk reduction. The reason being, lack of liquidity, if not the major, is one of the main fears that investors have when contemplating a financial market in a developing country. Truth to be told, low liquidity should be a concern, as it has the potential of crumbling the *raison d'être* of a financial market. A number of studies analyzing different aspects of a financial market support this notion, one example is research done by scholars from Yale University, Helsinki School of Economics, and MIT, that demonstrates how liquidity is essential for market performance (Holmstrom and Jean, 1993).

Following the structure of a report produced on October 1999 (CGFS, 1999a) by the Basel Bank for International Settlements, which was a reflection on a previous report produced on May 1999 (CGFS, 1999b), this section will be a *précis* of the October report. It will recount a set of guideline or principles that can improve the ability of the DIFX as a major entity serving economic growth in Dubai.

Principle 1: Support market structure competitiveness:

The DIFX should strive to ensure the continued competitiveness of the market structure, as “competition among dealers can heighten liquidity by increasing the pressure for a narrowing of bid/ask spreads” (CGFS, 1999a). This will help ensure that the exchange performs the function of mobilization of savings by reducing market frictions and transaction costs, and the function of reduction of risk by increasing trading and liquidity. One way that the DIFX management can improve competitiveness is by encouraging the

competition between the DIFX and other regional exchanges, or between the OTC market, and the organized exchange.

Principle 2: Contain the level of market fragmentation:

Fragmentation refers to the differentiation or segregation between different security types. Generally speaking the more homogenous securities are, the more they can be substituted and traded with each other. As such, if the DIFX is able to increase the substitutability of the securities traded, it will greatly expand the pool of securities that can be used to engage in a certain trade. This means that the market will be able to more quickly satisfy the needs of buyers and sellers, improving the level of liquidity. An example is issuing similar bonds but with different maturity dates.

Principle 3: Minimize transaction costs:

The easier and cheaper market participants can carry out a transaction, the more likely they will. Reducing transaction costs, which will consequently reduce the possible loss in case a trade goes bust, will encourage more trades, and thus increase liquidity.

Some costs are market driven, for example the necessary investments in firm infrastructure to ensure a continued value to stock holders, while others are exogenous to the market, such as government imposed taxes. In either case, lower transaction costs mean a smaller gap between the price paid by a buyer for a security, and that received by the seller. This in turn will mean a smaller portion of the savings is lost, with the majority going to the market to support investments and growth.

A point that should be noted here is that, principle 3 advises to minimize not eliminate market transaction costs. This is because, other than generating a profit for the DIFX, transaction costs also act as filters, pushing out want-to-be participants, that in reality lack proper fundamentals to trade, and whose entry will only destabilize the market. Therefore “some transaction costs, such as those involved in ensuring a sound payments infrastructure, are necessary to improve the overall robustness of the market” and “transaction costs should be minimized as long as this does not reduce the security of the market in question” (CGFS, 1999a).

Principle 4: Transparency of issuers and of trading information should be encouraged:

There are three types of transparency that influence market efficiency, issuers’ transparency; the transparency of the issue schedule; and market information

transparency. With the availability of an electronic platform on the DIFX, that is able to provide real time quotations, transparency with respect to market information is maintained, however there is a need on the DIFX to improve the other two.

Starting with the information on the quality of the issuers, the DIFX has imposed strict reporting requirements, and is trying to ensure market participants have enough information concerning an issuer. A factor that is still lacking however, and should be incorporated in the design, is the adoption of international standards with respect to issuers distributing information. An example of such standards is the IMF's Special Data Dissemination Standard (CGFS, 1999a).

The transparency of the issue schedule is important because, it affects the predictability of issuance. Improved predictability increases liquidity, as more investors will be able to participate in the market, since decisions concerning the creation of an optimal portfolio, can be made more readily. To this end, the DIFX can require issuers to have a "regular issuance cycle and to pre-announce the issue schedule, including the characteristics and amounts of the securities to be issued" (CGFS, 1999a). The DIFX should also consider the introduction of "when-if-issued" trading. It is trading on the relevant security that will occur between the day an auction is announced and the actual day it is conducted. This might enable the Market makers to provide tighter bid/ask quotations during the auction, reducing wastes, since the true value of the security would have been tested beforehand in the market. The reason I stress these two transparency requirements is because they are essential to attract international investors, and if performed successfully, have a great potential to increase market liquidity (CGFS, 1999a).

Principle 5: Introduction of new types of instruments: Repos, futures, and options:

The more a market design allows investors to undertake hedging, arbitrage, and speculations, the more attractive the market becomes. Therefore the DIFX should also consider the introduction of repos⁸, as they enable dealers to better finance the long positions, and settle the short positions, they hold. Thus respond faster to customer needs. The futures and option markets should also be encouraged as they will reduce the costs of arbitrage, allowing for better risk management.

⁸ A form of overnight borrowing, with the dealer selling securities to a lender and agreeing to repurchase them at a given future date and price

Conclusions

In conclusion, this thesis explains how financial markets' design can support the growth of a developing country, through the six functions: mobilization of savings; risk reduction; better information access; improved corporate control; facilitate the exchange; and support for financial integration.

The third part is a descriptive analysis of the design components of the Dubai International Financial Exchange. It is a financial market in a developing country supporting progress, whereby its components are able to perform afore six mentioned functions as follows:

Rules and regulations design component:

The comprehensive rules and regulations system in place, helps in retaining trust, and improve market economic returns, attracting more savings, and performing the function of savings mobilization. With respect to the listing rules, the possibility for simultaneous listing supports the function of financial integration. Through the requirement that securities are open for trading to all nationalities and satisfy internationally accepted standards, the function of risk reduction is also performed. Finally the benefits derived from using multilateral netting funnel into performing the function of savings mobilization, better information access, as well as risk reduction. Therefore the listing process has been designed to improve the pace of technological enhancements, by positively influencing the probability that capital flows to productive, long gestation period, projects.

Market model design component:

The market model design consisting of the three elements, trading, clearing process, and central security depository with a registrar, is able to support growth. Via the electronic and Market makers trading design, this is done by performing the function of mobilization of savings, the function of better information access, the function of facilitating the exchange, the function of risk reduction, and the function of corporate control. The clearing process supports growth by first performing the function of better information access, by giving an incentive to investors to search for and benefit from information. Second the function of risk reduction, through the process of novation, and the function of facilitating the exchange by improving market efficiency and increasing

the number of transactions, are achieved. Third, the function of mobilization of savings, by cutting costs and frictions, and the function of financial integration by supporting the creation of a single Central Counter Party facility, are also performed. Finally the registry and central security depository designs were shown to support growth by performing the function of risk reduction, through, among other things, diminishing the time it takes for a trade to be closed. This design element also performs the function of mobilization of savings by reducing market frictions and increasing the total amount of savings, and the function of facilitating the exchange through the SWIFT capability and the pledge facility. The registrar will support growth, through its ability as a DIFX design element, to perform the functions of corporate control and better information access.

At last as was explained through out the market model section above, performing these functions will improve the rate of capital accumulation and pace of technological enhancements.

Financial indices design component:

The DIFX currently incorporates three indices, whose designs support growth by performing the function of mobilization of savings, better information access, and corporate control and regulations through the use of index funds. The function of better information access is also performed by complementing the investors' ability to collect market data and speculate, to decide where best to invest, through better market representation. It was also shown how the design of the indices supports the function of financial integration.

In the end, and from what I have learned through researching and writing this paper, I can comfortably say that the DIFX does have the design to become a hub for financial services in the Middle Eastern region, and support the advancement of Dubai's economy. The only question however, is whether or not it will actually succeed in future years, becoming the sustainable source of income that its visionaries hope it is.

Literature list

1. Albuquerque, C., 2001. The traditional brokers: what are their chances in the Forex?. Journal of applied economics 6, No. 2.
2. Alici Asli, Ozgoker Ugur, 2006. Can Financial Regulations Strengthen Financial Stability in Developing Countries?: The Case of Turkey. Kadir Has University, Istanbul and University of Bath, England.
3. Al-Khazalia, F., Darrat, A., Saada M., 2006. Intra-regional integration of the GCC stock markets: the role of market liberalization. Department of Accounting and Finance, American University of Sharjah, UAE and Department of Economics and Finance, Louisiana Tech University, USA.
4. Bakos, J., 1991. A strategic analysis of electronic marketplaces. MIS Quarterly Journal 15, 295--310.
5. Beck R., Levine, Loyaza N., 2000. Finance and the sources of growth. Journal of Financial Economics 58, 261--300.
6. Bodie Z., Merton R.C., 2000. Finance. Prentice Hall.
7. Brigham F., Houston F., 2000. Fundamentals of financial management, 3rd edition. Bruce Rogovin.
8. Calderon and Liu, 2002. The Direction of Causality Between Financial Development and Economic Growth. Journal of Development Economics 72, 321--334.
9. Caprio Gerard, Folkerts Landan D.F.I., Lane Timothy, 1993. Building Sound Finance in Emerging Market Economies. Proceedings of a conference held in Washington D.C. International Monetary Fund.

10. CGFS- Committee on the global financial systems report 1999a. How should we design deep and liquid markets? The case of government securities. CGFS Publications No. 13. Bank for International Settlements, Basel Switzerland
< <http://www.bis.org/publ/cgfs13.htm> >.
11. CGFS- Committee on the global financial systems report 1999b. Market Liquidity: Research Findings and Selected Policy Implications. CGFS publication No. 11. Bank for International Settlements, Basel Switzerland
< <http://www.bis.org/publ/cgfs11.htm> >.
12. Chandavarkar, A., 1992. Of finance and development: neglected and unsettled questions. World Development 20, 133--142.
13. Chen Edward, Raymond, C.W.N., 2000. The Financial Sector and economic development in Hong Kong: Implications for developing countries, in: Masuyama Seiichi, Vandenbrink Donna, Yue Siow Chia (Eds.), East Asia's Financial systems evolution and crises. Nomura Research Institute.
14. Christopoulos, K., Tsionas, G., 2003. Financial development and economic growth: evidence from panel unit root and cointegration tests. Journal of Development Economics 73, 55--74.
15. Creane Susan, Goyal Rishi, Mobarak, A., Sab Randa, 2004. Financial Sector development in the Middle East and North Africa. International Monetary Fund.
16. DIFX- Dubai International Financial Exchange, 2005. Annual review 2005. Dubai, United Arab Emirates.
17. DIFX- Dubai International Financial Exchange, 2006a. An introduction to Listing on the DIFX. Dubai, United Arab Emirates. < <http://www.difx.ae> >.

18. DIFX- Dubai International Financial Exchange, 2006b. DIFX Business rules
Version 7. Dubai, United Arab Emirates. < <http://www.difx.ae> >.
19. DIFX- Dubai International Financial Exchange, 2006c. Market Model. Dubai,
United Arab Emirates. < <http://www.difx.ae> >.
20. Dorf, C., Byers, H., 2005. Technology Ventures From Idea to Enterprise,
International Edition. McGraw Hill.
21. Driffill John, Mickiewicz Tomasz, 2003. The order of financial liberalization:
lessons from the Polish experience, in: Colombo Emilio, Driffill John (Eds.), The
role of financial markets in the transition process. Physica-Verlag.
22. Financial sector development, 2004. The importance of financial sector
development for growth and poverty reduction. Department for international
development, Crown Publications.
23. Galper, I., Joshua, 2000. Value Chain Control in Financial Markets: Stock
Exchanges and Central Securities Depositories. MIT Sloan School of
Management, with support from the International Federation of Stock Exchanges.
24. Gibbins Michael, Richardson Alan, Waterhouse John, 1990. The Management of
Corporate Financial Disclosure: Opportunism, Ritualism, Policies, and Processes.
Journal of Accounting Research 28, 121--143.
25. Haney Scott, 1995. Money, Financial Markets, and the Economy. Prentice Hall.
26. Hicks John, 1969. A theory of economic history. Clarendon Press.
27. Holmstrom Bengt, Tirole Jean, 1993. Market Liquidity and Performance
Monitoring. The Journal of Political Economy 101, 678--709.

28. International Organization of Securities Committee, 1999. The influence of Market makers in the creation of liquidity. Report by the Emerging Markets Committee. <www.iosco.org/library>.
29. Karunaratne, Neil, 2002. Globalization, crisis contagion and the reform of the international financial architecture. The University of Queensland, Australia.
30. King, G., Levin, 1993. Finance and growth: Schumpeter might be right. The Quarterly Journal of Economics 108, 717--737.
31. Knapp, P., Velasco, A., 1997. Liberalization and Integration of Financial Markets in the Western Hemisphere. Inter-American Development Bank.
32. Kolb, W., 1995. The International Finance Reader, 3rd edition. Blackwell Publishers.
33. KSCC Global Investment House KSCC report, 2004. UAE Economic and strategic outlook I. KSCC, Kuwait.
34. KSCC Global Investment House KSCC report, 2005. UAE Economic and strategic outlook II. KSCC, Kuwait.
35. Kurt Schuler, 2004. Tables of Modern Monetary History Asia. Joint Economic Committee of the U.S. Congress.
36. Lane, Timothy, 1999. The Asian financial crisis what have we learned?. Finance and Development 36, No. 3.
37. Levine, 1997. Financial Development and Economic Growth: Views and Agenda. Journal of Economic Literature 35,688--726.
38. Levine, R., Loyaza, N., Beck, T., 2000. Financial intermediation and growth: causality and causes. Journal of Monetary Economics 46, 31--71.

39. Mann, S., Venkataraman, K., Waisburd, A., 2003. Stock Liquidity and the Value of a Designated Liquidity Provider: Evidence from Euronext Paris. Working Paper, Texas Christian University.
40. Mc Sheehy, 2006. Gulf Stock Markets Should Link Trading to Stem Falls, IMF Says. Bloomberg, London. <<http://www.bloomberg.com/apps/news>>.
41. Morck Randall, Yin Yeung, Bernard, Yu Wayne, 1997. The information content of stock markets: Why do emerging markets have so little firm specific risk. Davidson Institute working papers, series No.44.
42. Northern Trust, 2007. Emerging Markets Investing, efficiently adding emerging market equity to a global portfolio. < [www-ac.northerntrust.com/content/media/attachment/data/white_paper/0701/document/emergingmarkets_0107.pdf](http://www.ac.northerntrust.com/content/media/attachment/data/white_paper/0701/document/emergingmarkets_0107.pdf)>.
43. Pagano Marco, 1993. Financial Markets and growth, an overview. European Economic Review, No. 37, 613--622.
44. Panayides Marios, Charitou Andreas, 2004. "The Role of the Market Maker in International Capital Markets: Challenges and Benefits of Implementation in Emerging Markets. International centre of Finance, Yale School of Management, and department of Business Administration, University of Cyprus.
45. Patrick, H.T., 1966. Financial development and economic growth in underdeveloped countries. Economic Development and Cultural Change 14, 174--189.
46. Ripatti Kirsi, 2004. Central counterparty clearing: constructing a framework for evaluation of risks and benefits. Bank of Finland Discussion Papers 30/2004, Financial Markets department.

47. Rojas-Suarez, Liliana, 2004. Domestic Financial Regulations in Developing Countries: Can they Effectively Limit the Impact of Capital Account Volatility?. Centre for Global Development.
48. The Economist, 2006. Special report Dubai. The Economist Newspaper Ltd., December 16.
49. The New Dictionary of Cultural Literacy, 2002. Third Edition. E.D., Hirsch, Jr., Joseph F., James Trefil (Eds.), Houghton Mifflin Company.
50. Till Bernard, 1999. FIBV Clearing and Settlement Best Practices Report 1999. Unpublished paper. 39th Annual FIBV General Assembly, Bangkok.
51. Valdez Stephen, 2003. An introduction to global financial Markets. 4th edition. Palgrave Macmillan.
52. Valdez Stephen, 2007. An introduction to global financial Markets. 5th edition. Palgrave Macmillan.
53. Walsh John, 2004. ISSA 12 G30 Recommendations. International Securities Services Association, ISSA Symposium 15-18 June 2004.

Website references:

1. DIFX website a: Product listing guidelines
<<http://www.difx.ae/listing/products/index.html>>.
2. DIFX website b: Press release centre
<http://www.difx.ae/press_centre/2004/06_jul.html>.
3. Dow Jones Website at
<<http://www.djindexes.com/mdsidx/index.cfm?event=showArabiaTitansOverView>>
4. Dubai department of tourism, at the website <<http://www.dubaitourism.ae>>.
5. International Monetary Fund (IMF). World Economics Outlook 2001, Chapter IV.
At the website <<http://www.imf.org/external/pubs/ft/weo/2001/02/index.htm>>.
6. Merrill Lynch Website at < <http://www.mlinvest.ml.com/Index.aspx?p=4369b16d-cbb0-41a2-b7e2-7c4cd03e13dc>>.
7. The Financial Times Stock Exchange (FTSE) at the website
<<http://www.ftse.com/difx>>.

APPENDIX I

List of product types and obligations

	Security Types						
	Equity Products			Funds	Islamic Products		
	Shares	Certificate over shares including DRs*	Warrants Over Shares	Funds	Govt Sukuks	Corporate Sukuks	Islamic Funds
Requirements							
All documents must be in English	✓	✓	✓	✓	✓	✓	✓
Issuer must be in compliance with any securities regulator by which it is regulated and all applicable laws in which it is incorporated	✓	✓	✓	✓	✓	✓	✓
Issuer should appoint a sponsor (for Islamic products a Shari'a Supervisory Board is also required)	✓	✓	✓	✓	✓	✓	✓
The DIFX must be of the view that the issuer and its business are suitable for listing	✓	✓	✓	✓	✓	✓	✓
Directors of issuer, fund, investment manager must have the appropriate experience and expertise	✓	✓	✓	✓	✓	✓	✓
Trading and settlement arrangements must be acceptable to the DIFX	✓	✓	✓	✓	✓	✓	✓
There must be an adequate and open market in the securities (Guidance: minimum free float after listing on the DIFX of 25%)	✓	✓	✓				
Audited annual accounts for last three years produced in accordance with IFRS**	✓	✓	✓		May be waived where originator of SPV has appropriate 3 year track record		
Business must be run independently of any majority shareholders	✓	✓	✓				
Warrants should not exceed 20% of outstanding share capital	✓	✓	✓				
Minimum market capitalization, \$50M	✓	✓	✓				
Minimum net assets of \$10 million						✓	
Underlying security must be listed on the DIFX or an exchange recognized by the DIFX		✓	✓				
Issuer must hold on trust the underlying		✓					

securities							
------------	--	--	--	--	--	--	--

	Equity Products			Funds	Islamic Products		
	Shares	Certificate over shares including DRs	Warrants Over Shares	Funds	Govt Sukuks	Corporate Sukuks	Islamic Funds
Requirements							
Issuer must operate in a jurisdiction where the underlying securities do not form part of its assets on bankruptcy/insolvency		✓					
Issuer of underlying security must sponsor the issue and sign an undertaking with the DIFX agreeing to comply with continuing obligations as though it was the issuer of the certificates		✓					
Any restrictions on transferability of securities must be acceptable to the DIFX	✓	✓	✓	✓	✓	✓	✓
Must be USD denominated	✓	✓	✓	✓	✓	✓	✓
The whole class of securities must be listed	✓	✓	✓	✓	✓	✓	✓
All securities within the same class must carry the same rights, including voting rights	✓	✓	✓	✓	✓	✓	✓
Security holders to have specified rights to share in the profits	✓			✓			✓
Investors must have access to sufficient information on underlying security		✓					
Underlying securities cannot be treated as assets or liabilities of the issuer of the certificates		✓					
The certificate must not impose obligations on the issuer other than is necessary for the protection of the certificate holders' rights to and transmission of entitlements of the underlying securities		✓					
Payments arising from the underlying securities must be sufficient to meet payments required under the certificates at the time of issue		✓					

	Equity Products			Funds	Islamic Products		
	Shares	Certificate over shares including DRs	Warrants Over Shares	Funds	Govt Sukuks	Corporate Sukuks	Islamic Funds
Requirements							
The fund must appoint a custodian acceptable to the DIFX to safeguard its assets which must be a separate legal entity from the fund, its directors, the investment manager, investment adviser and the fund's administrator, but may be an associate of any of them				✓			✓
Appoint an independent auditor				✓			✓
The net asset value of the fund's securities must be calculated at least quarterly and method fully disclosed in offering documents in accordance with applicable accounting standards				✓			✓
No requirement for a bond rating (e.g. Moody's, S&P)					✓	✓	
A trustee or independent representative must be appointed to represent the interests of the holders					✓	✓	
Issuer must either be an international financial institution acceptable to the DIFX with a credit risk profile and sufficient net tangible assets or the securities must be irrevocably and unconditionally guaranteed							
There must be at least one market maker acceptable to the DIFX							
Issuer must appoint and maintain a paying agent							
Issuer must have permission and/or the appropriate licence from the owner of any index used							
The securities must be fully paid and not carry any contingent liabilities for holders							

	Security Types				
	Income Products			Index Certificates	
	Govt & Supranationals	Other Debt Securities	Warrants over debts	Designated Investments	
Requirements					
All documents must be in English	✓	✓	✓	✓	
Issuer must be in compliance with any securities regulator by which it is regulated and all applicable laws in which it is incorporated	✓	✓	✓	✓	
Issuer should appoint a sponsor (for Islamic products a Shari'a Supervisory Board is also required)	✓	✓	✓		
The DIFX must be of the view that the issuer and its business are suitable for listing	✓	✓	✓	✓	
Directors of issuer, fund, investment manager must have the appropriate experience and expertise		✓	✓	✓	
Trading and settlement arrangements must be acceptable to the DIFX	✓	✓	✓	✓	
There must be an adequate and open market in the securities (Guidance: minimum free float after listing on the DIFX of 25%)					
Audited annual accounts for last three years produced in accordance with IFRS*		✓	✓	✓	
Business must be run independently of any majority shareholders					
Warrants should not exceed 20% of outstanding share capital					
Minimum market capitalisation, \$50M					
Minimum net assets of \$10 million		✓	✓		
Underlying security must be listed on the DIFX or an exchange recognised by the DIFX			✓		
Issuer must hold on trust the underlying securities					

	Income Products			Index Certificates	
	Govt & Supranationals	Other Debt Securities	Warrants over debts	Designated Investments	
Requirements					
Issuer must operate in a jurisdiction where the underlying securities do not form part of its assets on bankruptcy/insolvency					
Issuer of underlying security must sponsor the issue and sign an undertaking with the DIFX agreeing to comply with continuing obligations as though it was the issuer of the certificates					
Any restrictions on transferability of securities must be acceptable to the DIFX	✓	✓	✓	✓	
Must be USD denominated	✓	✓	✓	✓	
The whole class of securities must be listed	✓	✓	✓	✓	
All securities within the same class must carry the same rights, including voting rights	✓	✓	✓	✓	
Security holders to have specified rights to share in the profits					
Investors must have access to sufficient information on underlying security					
Underlying securities cannot be treated as assets or liabilities of the issuer of the certificates					
The certificate must not impose obligations on the issuer other than is necessary for the protection of the certificate holders' rights to and transmission of entitlements of the underlying securities					
Payments arising from the underlying securities must be sufficient to meet payments required under the certificates at the time of issue					

	Income Products			Index Certificates	
	Govt & Supranationals	Other Debt Securities	Warrants over debts	Designated Investments	
Requirements					
The fund must appoint a custodian acceptable to the DIFX to safeguard its assets which must be a separate legal entity from the fund, its directors, the investment manager, investment adviser and the fund's administrator, but may be an associate of any of them					
Appoint an independent auditor					
The net asset value of the fund's securities must be calculated at least quarterly and method fully disclosed in offering documents in accordance with applicable accounting standards					
No requirement for a bond rating (e.g. Moody's, S&P)	✓	✓	✓		
A trustee or independent representative must be appointed to represent the interests of the holders	✓	✓			
Issuer must either be an international financial institution acceptable to the DIFX with a credit risk profile and sufficient net tangible assets or the securities must be irrevocably and unconditionally guaranteed				✓	
There must be at least one market maker acceptable to the DIFX				✓	
Issuer must appoint and maintain a paying agent				✓	
Issuer must have permission and/or the appropriate license from the owner of any index used				✓	
The securities must be fully paid and not carry any contingent liabilities for holders				✓	

Source: DIFX website a

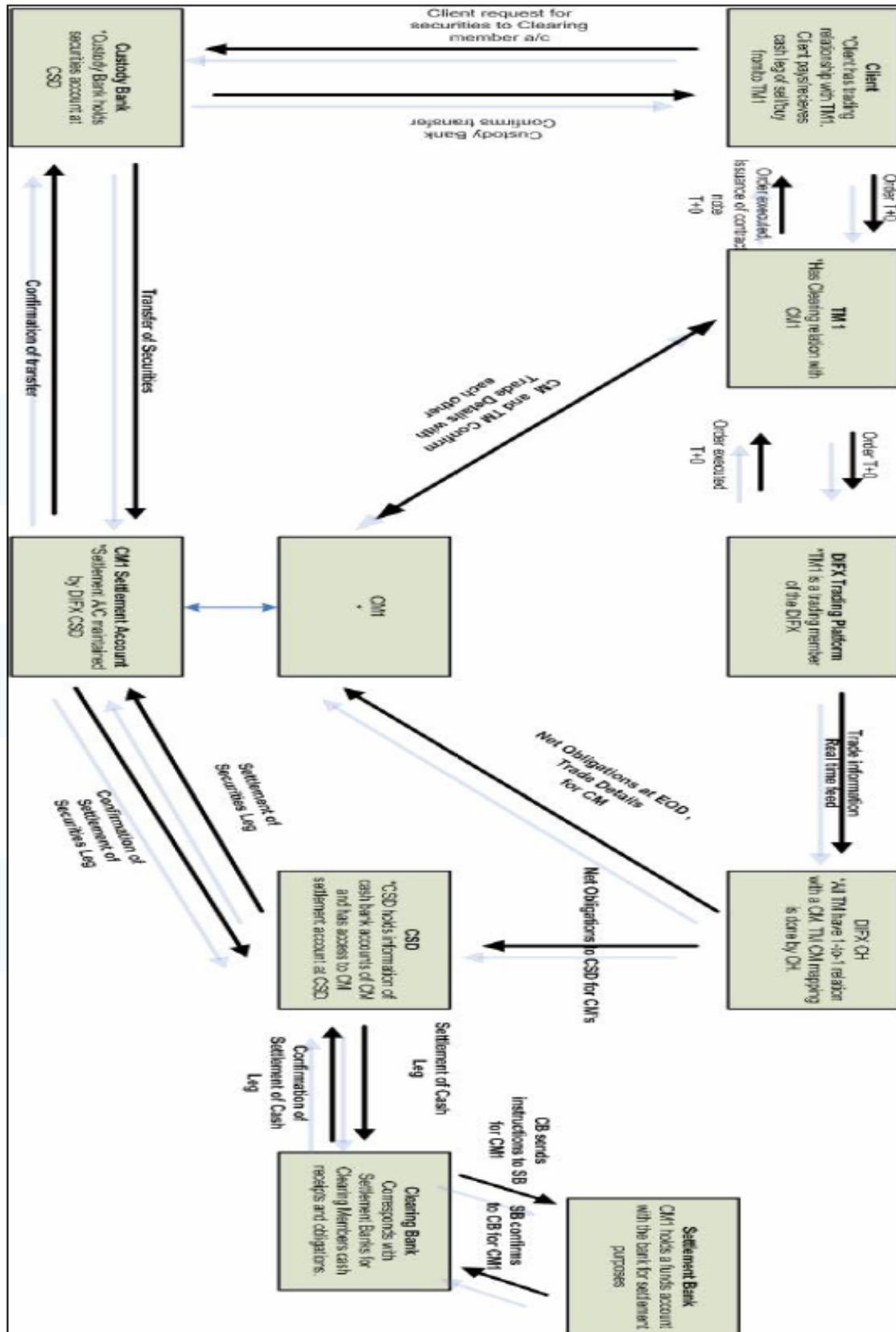
*Depository Receipt

**International Financial Reporting Standards

Appendix II

An example of a trade life cycle on the DIFX, showing transaction flows of market model components.

Source: DIFX, 2006a



APPENDIX III

Example of multilateral netting calculations

Member A executes the following on Stock X

Transaction (A)	Quantity (B)	Price (C)	Total Value (B*C)
Buy	50,000	10.00	500,000
Sell	20,000	11.00	220,000
Buy	40,000	10.50	420,000
Buy	100,000	11.25	1,125,000
Sell	55,000	10.00	550,000
Buy	62,000	11.50	713,000

Member A also executes the following on Stock Y

Transaction (A)	Quantity (B)	Price (C)	Total Value (B*C)
Buy	5,000	90.00	450,000
Sell	7,000	95.00	665,000

Source: DIFX, 2006c

Netting Calculations:

From Stock X member A will receive a quantity of 177,000 and has a total funds debit of 1,988,000.

Quantity Calculated as:

$$+ 50,000 - 20,000 + 40,000 + 100,000 - 55,000 + 62,000 = +177,000$$

Value of debit/credit calculates as:

$$\begin{aligned} & -500,000 + 220,000 - 420,000 - 1,125,000 + 550,000 - 713,000 = \\ & -1,988,000 \text{ (Debit)} \end{aligned}$$

From Stock Y member A has to deliver a quantity of 2,000 and has a funds credit of 215,000.

Quantity Calculated as:

$$+5,000 - 7,000 = -2,000$$

Value of debit/credit calculates as:

$$-450,000 + 665,000 = +215,000 \text{ (Credit)}$$

Thus member A will have to pay a net value of 1,773,000 (the netted debit for A).

APPENDIX IV

List of companies and weights compromising the DIFC Arabia Titans 50

<u>Name</u>	<u>Country of Origin</u>	<u>Weight representation in index</u>
Emaar Properties	UAE	5.69%
Ahli United Bank	Bahrain	3.08
Al Ahli Bank of Kuwait K.S.C.	Kuwait	2.81
Arab Bank	Jordan	4.90
Arab Potash Co.	Jordan	0.69
BLOM Bank S.A.L. GDS	Lebanon	0.62
Bahrain Telecommunications Co.	Bahrain	3.82
Bank Muscat	Oman	0.19
Bank of Bahrain & Kuwait B.S.C.	Bahrain	2.16
Bank of Kuwait & the Middle East	Kuwait	1.20
Banque Audi S.A.L.	Lebanon	0.62
Banque Commerciale du Maroc	Morocco	1.87
Banque Marocaine du Commerce	Morocco	1.07
Banque Marocaine Commerce	Morocco	0.77
Burgan Bank S.A.K.	Kuwait	1.30
Coast Investment & Development	Kuwait	0.76
Commercial Bank of Kuwait	Kuwait	3.08
Commercial Facilities Co.	Kuwait	1.40
Commercial International Bank	Egypt	0.65
Egyptian Company for Mobile Services	Egypt	1.60
Groupe ONA	Morocco	2.36
Gulf Bank of Kuwait K.S.C.	Kuwait	2.93
Gulf Cable & Electrical Industries	Kuwait	1.17
International Financial Advisors	Kuwait	1.04
Jordan Cement Factories Co. Ltd.	Jordan	1.00
Jordan Telecommunications	Jordan	1.14
Kuwait Cement Co. K.S.C.	Kuwait	1.18
Kuwait Finance House K.S.C.	Kuwait	6.02
Kuwait Food Co. S.A.K.	Kuwait	1.64
Kuwait Investment Co. S.A.K.	Kuwait	0.77
Kuwait Investment Projects Co.	Kuwait	0.95
Kuwait Real Estate Bank K.S.C.	Kuwait	1.18
LaFarge Ciments	Morocco	1.80
Mobile Telecommunications Co.	Kuwait	7.26
National Bank of Bahrain	Bahrain	1.33
National Bank of Kuwait S.A.K.	Kuwait	7.84
National Industries Co. S.A.K.	Kuwait	1.46
National Mobile Tele Co.	Kuwait	3.31
National Real Estate Co. S.A.K.	Kuwait	1.49
Oman International Bank	Oman	0.10
Orascom Construction Industries.	Egypt	1.71
Orascom Telecom Holding	Egypt	2.75
Public Warehousing Co. K.S.C.	Kuwait	2.77
Qatar Telecom	Qatar	6.37
Societe National d'Investissement	Morocco	1.62
Societe a Marocaine de l'Industrie du Raffina	Morocco	0.56
Solidere CI A	Lebanon	2.05
Suez Cement Co.	Egypt	0.72
Vodafone Egypt Tel Co.	Egypt	2.05
Wafabank	Morocco	0.78
TOTAL	UNIVERSE	100.00

Source: DIFX website b

APPENDIX V

FTSE DIFX index top five constituents and index series break down

Index Series Breakdown

		Shari'ah			Non Shari'ah	
Country	No. of constituents	Full Market Capitalization (million USD)	Investable Market Capitalization (million USD)		Full Market Capitalization (million USD)	Investable Market Capitalization (million USD)
Kuwait	15	42,294	19,472		67,920	28,985
Qatar	10	31,994	7,998		37,207	9,302
UAE	15	N/A	N/A		67,424	36,887
Total	40	74,287	27,471		172,552	75,174

Source: FTSE group data, FTSE website.

FTSE DIFX Index series top five constituents

Name	Index	Country	Sector	Full Market Capitalization (million USD)	Investable Market Capitalization (million USD)
Emaar properties	FTSE DIFX UAE 15 index	UAE	Financial services	18,258	13,693
Mobile Tel Co.	FTSE DIFX Kuwait 15 index	Kuwait	Technology	12,254	6,005
National Bank of Kuwait	FTSE DIFX Kuwait 15 index	Kuwait	Banks	12,995	5,198
Kuwait Finance House	FTSE DIFX Kuwait 15 index	Kuwait	Financial services	8,389	3,356
Abu Dhabi Commercial Bank	FTSE DIFX UAE 15 Index	UAE	Banks	8,179	3,272

Source: FTSE Group data, FTSE website.

